THE ENGINEERING AND MINING JOURNAL.

WITH WHICH IS INCORPORATED

THE COAL AND IRON RECORD.

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THE ENGINEERING AND MINING JOURNAL

Is devoted to MINING, METALLURGY, GAS MAKING and ENGINEERING.

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Correspondence and general communications and books for review should be addressed to MR. ROTHWELL. Business communications should be addressed to the Secretary.

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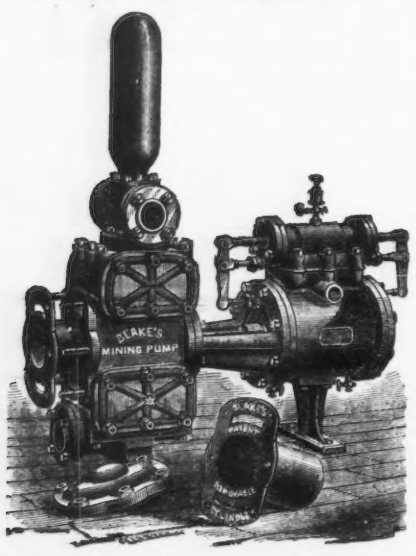

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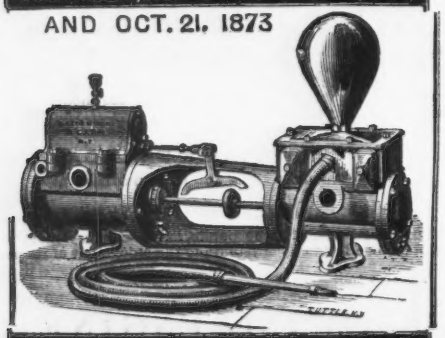

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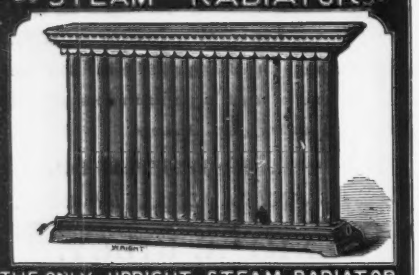

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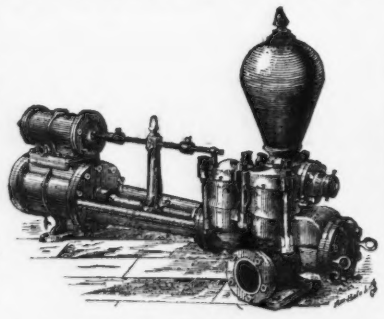

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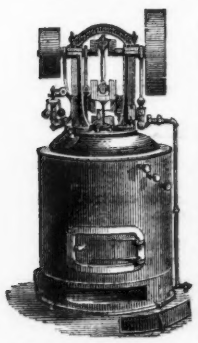

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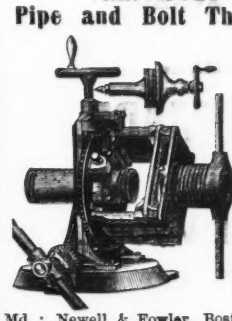

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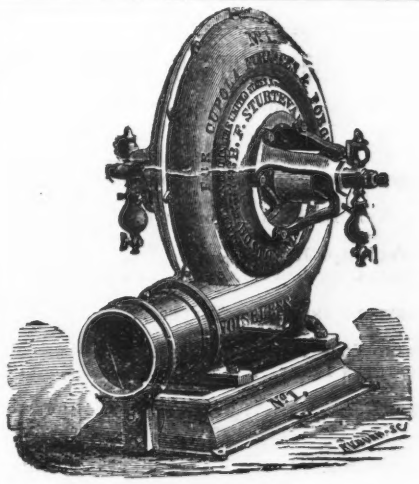

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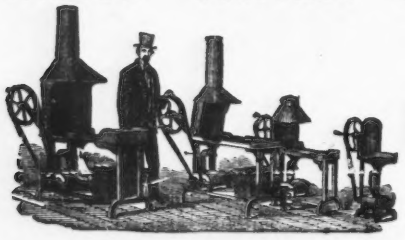

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REG. JUNE 8TH 1871.

Without decreasing size of any part of our "Engineers' Transit" we have reduced the weight one-half. An ordinary Transit Telescope magnifies from 10 to 12 diameters, our new Transit Telescope (length 10½ inches, shows objects erect and not inverted) magnifies 28 diameters and will read time on a watch-dial at 983 feet. For description of our new Mining Transit (weight 5½ lbs.) and Plummet Lamp, see Van Nostrand's Engineering Magazine, June, 1873.

Extract from report of Committee of Civ. Engs. appointed by Franklin Inst. to examine H. & B.'s new Transit [Dec. 1871]: "It exhibits several novelties of construction which, in the opinion of the committee, render it superior to those now in use, and in its opinion the deviations which they have made from the common styles of Transit are decided improvements."

JOHN C. TRAUTWINE, Chairman.

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THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W RAYMOND, Ph. D. } Editors.

NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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Centennial Report of the Coal Production of the United States.

THE readers of the ENGINEERING AND MINING JOURNAL know the efforts we have made, during the past eighteen months, to obtain full reports of the coal production of the whole country. We have been partially successful, and were able to publish (Vol. xx. page 4) the most complete statistics of that industry that had ever been compiled.

We have now undertaken the work of preparing a *special report upon the coal production of the United States for the Century just closing*, which will show the growth and present magnitude of this great industry.

This arduous task has been assumed with a full appreciation of the amount of labor involved, but counting on the cordial co-operation of the officers of railroads and mines, and others who possess the desired information.

Circulars and blank forms have been prepared which will be sent to all whom we think are in a position to give the desired information, and as some companies and mine owners object to making known the extent of their business, all reports will, where so desired, be considered as *strictly confidential*, and will be used *only* in the compilation of aggregates and of general remarks. These aggregate reports of the current year will be published regularly in the *Engineering and Mining Journal*, and, where so desired, a special table will be published of those who have furnished returns, with the amount of their reports.

Though there are none who will question the importance of having the extent and value of our mineral resources fully represented at the International Exhibition next year, there are yet comparatively few who fully appreciate the immense value a full representation of our coal statistics may have upon the development of our railroad, mineral and other enterprises.

Coal is the mainspring of modern civilization, and cheap coal the foundation of all commercial prosperity. There is no better or surer guide in measuring the industrial progress of a country, than a study of its coal statistics. A full and reliable statement of the amount of coal mined and used throughout the country; the cost per ton at the mines and to the consumer, and the proportions used in the several industries, cannot but convince the world that no other country has ever made such rapid progress, and that none has laid a more substantial foundation for permanent prosperity. No argument we could use with political economists and with capitalists could be more potent than a reference to the enormous increase in our coal production; for this tells, in an unerring manner, the growth of industry, of manufacturing, of science and of art. Who can question the importance to the whole country of convincing foreign capitalists, from whom we must for many years to come seek the means necessary to develop our rich natural resources, that our wonderful progress is not due to any accidental or transient cause, but to the healthy growth of mining and manufacturing industry, and that, consequently, we offer the utmost security for their investments?

In this view we look upon the collection of full and correct statistics of our coal production as a matter of great national importance, and we ask the assistance of all who can aid us. Our contemporaries can materially assist us in the work by calling the attention of their readers to the subject and to our request for co-operation.

The Use of Natural Gas Extending.

THE highly satisfactory results obtained by the use of natural gas in puddling and heating furnaces at Erie, Leechburg, and other places in Pennsylvania, has induced a serious effort to bring this excellent fuel from the great gas well in Butler Co., Pa., to the ironworks of GRAFF, BENNETT & Co., and SPANG, CHALFANT & Co., in Pittsburgh.

It is proposed to use a pipe 6 inches in diameter and 17 miles long; this will be carried in a trench 3 feet deep, and the work is under contract to be finished within a month.

Near Beaver Falls, Pa., a well of the depth of 1100 feet produces gas in large quantities, which is being used in the file factory at that place.

We learn that there is a movement on foot in Pittsburgh to form a company whose object shall be to purchase all the gas-wells in Butler County, and bring their gas through a 12-inch pipe to the manufactories.

In fact, the use of natural gas is rapidly increasing; and as there is every probability that it can be found, not only in or near the oil regions of Pennsylvania, but also in a large part of the State of New York and in other parts of the country, we shall probably soon see a "gas excitement," as we have had an "oil fever;" and the diamond-drill will be called in to test the gas-bearing strata wherever they lie at a depth from the surface sufficient to insure the retention of the gas. In the meantime, those who cannot have a gas-well at their doors can, for a few hundred dollars, have an EAMES' petroleum furnace, which will furnish an artificial gas of somewhat similar character to that manufactured in the laboratory of nature.

The use of gaseous fuel is becoming more and more prominent as that improvement on which our metallurgical supremacy may largely depend, and it has already attained such practical importance as should secure for it the best and most immediate attention of our ironmasters.

The Lake Superior Silver Excitement.

THERE has lately been much excitement in the Ontonagon and Marquette regions, over the rich yield of the silver ore found there.

The following report of the superintendent of the works, which we take from the *North Western Mining Journal*, gives the result of the first test of the Ontonagon Silver Works' ore :

ONTONAGON SILVER WORKS,
IRON RIVER, July 22, 1875.

TERRENCE MOORE, Esq., President Ontonagon Silver Co.

Dear Sir—I respectfully submit the following brief report of the trial run just finished at the company's mill. The mill was put in motion on the 5th inst., but owing to difficulties incident to the starting of new machinery, the run was not completed till the 20th. The rock treated was a lot of twenty-two tons, taken as it came from the mine. The result was 523 ounces of fine bullion, nearly 24 ounces per ton. Not having proper assay fixtures I could not determine its fineness and coin value, but I estimate it at 950 fine, and its currency value at $734. The mill is now in good condition, the only drawback to its efficiency being its small capacity. A twenty-stamp mill could reduce the ore at less than half the cost per ton than this five-stamp mill can treat it for. Respectfully yours, F. W. CROSBY.

Mr. CROSBY is said to be a gentleman of experience. having been engaged for many years in the treatment of the silver ores of Colorado and other western districts.

Mr. CROSBY has also furnished a detailed estimate of the "cost of treating such ores as those of the Ontonagon district," with works having a capacity of 40 tons per day of 24 hours. To reduce, he says, 40 tons per day, would require a 20-stamp mill, and the operating expenses would be $2 80 per ton! "This," says Mr. CROSBY, seems like a low estimate, but it covers every item except interest on capital."

The cost of mining will not necessarily exceed $2 50 per ton. Mr. CROSBY's estimate further shows that the veins would pay handsomely if the average yield of silver was not over $15 per ton.

Ore from the Scranton Mine, of the same district, has been tested with very satisfactory results : 4½ tons of the ore yielded 163 ounces, equal to $45 27 per ton coin value.

The Scranton mine is nearly two miles West of the Ontonagon, and is owned by gentlemen from Scranton, Pa. The Superior mine will next be tested, and its ore having been mined with greater care than either of the others, we are prepared to hear of a result even more gratifying than that of the Scranton.

The information we have from this region is quite promising, and if the results of the above trials should prove to represent average ore, we may look for a great influx of capital into that region, and, let us hope, a corresponding efflux of bullion from these mines. Our Lake Superior friends have not yet begun to make comparisons of their profits with the national debt, but they already insinuate that the Comstock will have to take a back seat.

Centennial Collection of Ores.

THE government intends to have a representative collection of the ores and mineral products of the United States at the Centennial Exhibition. The Smithsonian Institution has taken the matter in charge in an earnest, systematic way, which gives promise of a success gratifying to our national pride, and commensurate with the practical importance of the work. There has been too much reason to fear that, through apathy or neglect, and the want of well directed organized effort, this most important branch of national wealth would not have a fair representation in our Centennial Exhibition, even though the act of Congress declares that the products of the mine shall be exhibited as well as those of the field and forest.

The fact is, our government has never made any well-directed effort to obtain a collection of the useful minerals of the country, and though a very crude attempt in this direction was instituted by the Land Office, the results of this well-meaning, but totally inadequate, effort are simply ridiculous. Yet it can scarcely be questioned that the organization of a Museum of Practical or Economic Geology, (somewhat on the plan of that in London), in which would be found specimens and full information of the useful minerals from all parts of the country, would prove exceedingly valuable, and would tend to increase the knowledge, especially among foreigners, of the immense mineral resources of the country. The large amount of minerals that has been accumulating for years in the rooms of the Smithsonian Institution—which is, by law, the custodian of the National Museum—would form an excellent nucleus for the grand collec

tion of useful minerals, which, we trust, will one day worthily represent the country at Washington. Large additions are now being made to this collection, for exhibition at the Centennial, in the building now erecting for the United States Government Departments. The organization and general direction of the work have been confided by the Institution to Prof. WM. P. BLAKE, of New Haven, Conn., a gentleman eminently qualified by professional education as a mining engineer, by an extensive acquaintance with our different mining regions, as well as by experience in International Exhibitions, to have charge of the work. We congratulate the Smithsonian Institution on this appointment, and in congratulating Professor BLAKE, we would intimate that the inconvenience of reputation for eminent fitness is, that much more is expected from him than would be from those not so well qualified. Judging from the manner in which the work has been commenced, we have no doubt the economic minerals of the country will be fully represented, and with that order and classification which will facilitate their study.

The following circular has been issued by Professor HENRY, inviting the co-operation in the work of all persons interested in our mines and mineral products:

"The Smithsonian Institution wishes to secure as complete a collection as possible, to illustrate the mineral resources of the United States and the chief mining and metallurgical products at the International Exhibition to be held in Philadelphia in the Centennial Year 1876. This collection will constitute a portion of the Governmental display made by the Executive Departments, in accordance with the Executive order of March 5, 1875, and the act of Congress of March 3, 1875.

"A representation of the great variety of mineral productions of the country has not yet been systematically collected and exhibited by the General Government. Such a collection, formed and arranged with skill and discrimination, is important, for the purpose of presenting a general view of the extent and variety of these productions at the Exhibition, and will constitute a portion of the National Museum, where it will be permanently arranged after the Exhibition.

"The Institution is aware of the great difficulty of obtaining such a collection, especially in the limited time before the Exhibition; but it confidently asks and relies upon the hearty and patriotic co-operation of mine-owners, superintendents, engineers, geologists, and of all who are able to contribute to the success of the object in view. The collection now in the Museum will be freely used for the purpose.

"Due credit will be given in the Exhibition and Catalogue both to the locality and the contributor. Attention is invited to the circular of directions, and to the systematic enumeration of the principal mineral substances used in the arts, copies of which will be mailed on application.

"At each of the great international exhibitions abroad the respective governments caused liberal and methodical displays of mining industry and its products to be made co-ordinately with agriculture and its products. These displays were not only of great direct service to the countries making them, but advanced the knowledge of geology, mineralogy, mining and metallurgy. In making such collections the governments of Europe had the advantage of the aid of organized corps of mine-engineers in the service of the State. In the absence of such an organization in the United States, a great part of the labor of obtaining a just representation of its mineral wealth must be left to voluntary patriotic effort."

A list of co-operators has been published, comprising the names of many of the most active and distinguished geologists and mining engineers of the country, and of persons engaged in mining industry. Each person named is specially called upon to promote the success of the undertaking by securing specimens in his neighborhood, or at the mines under his control. These co-operators are also requested to correspond with the Director of the collection, giving such information and suggestions as in their view will assist in making the collection in every way worthy of the country.

The expenses of the exhibition—of classifying, labelling, cataloguing, unpacking and arranging will be paid by the Institution, under suitable regulations, as to the quantity and size of specimens.

THE CLASSIFICATION.

The following classification and enumeration of the principal useful minerals and mineral products is comprehensive and complete, and is worthy of attention, as a very suggestive outline of the extent to which our industries are based upon mining. It is a practical and economical, rather than a theoretical or mineralogical, classification, and in that respect it commends itself to the favor of the practical people to whom the invitation for assistance is made. In fact, aims at making the National Collection useful rather than merely ornamental. Indeed, the principal objects of this collection of the useful ores and minerals of the country are declared to illustrate:

"1st. The nature and variety of the mineral resources of the United States;
2d. The geographical distribution and geological associations of these resources;
3d. The extent to which they have been utilized;
4th. The mechanical, metallurgical, and chemical processes by which they are extracted or converted into useful products;
5th. The inherent and comparative qualities of the extracted products viewed as materials rather than as manufactures."

The classification contemplates the arrangement of the collection under eleven heads, as follows:

I. Systematic collections, chiefly educational and scientific.
II. Fuels and petroleum.
III. Ores, metals, and their immediate derivatives.
IV. Ornamental stones and gems.
V. Building stones; marbles, etc.
VI. Artificial stones; lime; mortars; cement.
VII. Fictile materials and direct products.
VIII. Pigments: colors; detergents.
IX. Grinding, abrading, and polishing substances.
X. Fertilizing substances.
XI. Sulphur, salts, and minerals chiefly used in chemical manufactures.

I. SYSTEMATIC COLLECTION, CHIEFLY SCIENTIFIC AND EDUCATIONAL.

1. *Minerals.*—Collections of mineral species systematically arranged. Collections illustrating the varieties, modifications, and associations of single species. Collections illustrating the standards of color and of hardness. Crystallographic collections; models of crystals, and illustrations of the systems of crystallization.

2. *Rocks and Soils.*—Collections of rocks systematically arranged, by their nature, or geographically, to illustrate the geology of countries or districts. To illustrate all varieties of particular rocks, as the gradations of granite, porphyry, trachyte, dolerite, etc. Soils and disintegrated rocks, barren or fertile.

II. FUELS AND PETROLEUM.

1. *Peat and Coal.*—Peat in its natural state and compressed. Lignites and brown coal. Bituminous and anthracite coals of the Tertiary and Secondary periods, with specimens of coke, etc. Bituminous coal of the Carboniferous period, with coke. Anthracite coal of the Carboniferous period; white ash; red ash; iridescent coal, etc. Cannel coals; jet coals; block coals; coals of peculiar composition and form. Pressed coals, and artificial agglomerations of mineral coals; coke.

2. *Asphalts and Bitumens.*—Asphalts, and asphaltic limestones. Bitumen and bituminous shales. Paraffine and paraffine oil; ozokerite. Amber, etc.

3. *Petroleum and Inflammable Gases.*—Petroleum in its crude state. Petroleum oil for lubricating purposes. Petroleum oil for illuminating and other purposes. Naphtha. Combustible gases from natural resources. Data, statistics, etc.

III. ORES, METALS, AND THEIR IMMEDIATE DERIVATIVES.

1. *Gold.*—Gold quartz, vein gold, auriferous pyrites, and compounds of gold with tellurium and other elements. Gold quartz tailings, and concentrated sulphurets; roasted sulphurets, and results of the chlorination and other processes for extracting gold. Gold amalgam, as taken from the batteries and concentrators; gold amalgam, as retorted; gold in the ingot, as shipped. Placer gold and auriferous alluvia, from rivers, dry diggings, beaches, and ancient channels; cement gravel, blue and red; tailings, from sluices; black sand and heavy minerals found with the gold when "cleaning up;" gold in scales and nuggets, with models of celebrated masses.

2. *Silver.*—Native silver in masses and in the veinstone. Ores of silver of all kinds and gradations of value, as mined and worked. Crushed ores of silver, raw and roasted, preparatory to treatment; samples of the results of processes for the extraction of the silver; residues, tailings, etc. Silver amalgam and retorted amalgam; silver, from cupellation; silver bullion and bars.

3. *Platinum Metals.*—Native platinum; specimens of grains, scales, and nuggets as found; models of nuggets; mixed metals as extracted from washings. Platinum ingots, bars, wire, and plate. Alloys of platinum and other metals of this group. Iridium and iridosmine; grains and scales as found and as extracted from gold by melting; selected grains as used for pens. Iridium alloys; Matthey's alloys. Palladium and its alloys.

4. *Quicksilver.*—The native metal; ores of the metal; quicksilver as extracted; secondary products and residues of the processes of extraction. Amalgams, as prepared and used in the arts.

(For cinnabar and vermillion as pigments see VII.)

5. *Iron and Steel.*—Native iron; meteorites. Iron ores of all varieties and grades, including magnetite, hematite, franklinite, limonite, spathic ore, black band, etc. Fuels used and fluxes; slags, slag bricks and blocks. Cast iron; pig iron, etc.; specimens of various grades of pig iron; mangan-iron; ferromanganese. Blooms; bar and sheet iron; specimens illustrating toughness and strength. Steel of various kinds; Bessemer Steel; open-hearth steel; crucible steel; puddled steel; blister steel.

6. *Copper.*—Native copper as found in the soil or in water-worn masses; as cut from the mine; as separated from the rock by stamping and by washing; specimens in the veinstone and conglomerate. Ores of copper in mass and in the various stages of dressing and concentration for shipping or smelting. Specimens illustrating the metallurgical treatment of copper ores and copper; the materials used; copper matt, slags, and residues; black copper; cement copper; rose copper; copper in ingots, bars and sheets. Copper by the wet way; materials and results of various processes for extraction of copper in the "moist way." Alloys of copper; brass, bronze, etc.

7. *Zinc Ores and Products.*—Red zinc ore and results of working; willemite and calamine and their products; sulphuret of zinc; metallic zinc; zinc oxide.

8. *Lead Ores and Products.*—Various ores of lead with the metal produced from them, in bars, sheet, shot, pipe, etc. Oxides and compounds of lead; litharge, red lead, chrome yellow, etc.

9. *Tin Ores and Products.*—Tin ore from alluvial deposits and from veins; block tin; alloys of tin.

10. *Bismuth, Antimony, Arsenic etc.*—Ores and compounds of these elements, and the results of their metallurgical treatment. Alloys of antimony and other metals of this group.

11. *Nickel and Cobalt.*—Ores of nickel, and results of their treatment for extraction of nickel; nickel of various grades of purity. Ores of cobalt; metallic cobalt and cobalt oxide.

IV. ORNAMENTAL STONES AND GEMS.

1. *Quartz. Vitreous Varieties.*—Rock-crystal; asteriated (star-quartz); amethystine; rose; yellow, false topaz; smoky, cairngorm stone; milky; greasy; sapphire quartz; sagenitic; moss agates; cat's-eye; aventurine; impure ferruginous; containing liquids.

Massive Sub-crystalline Varieties.—Chalcedony, carnelian, chrysoprase; prase; plasma; heliotrope; jaspis; agates; onyx; sardonyx; agate-jasper; silicious sinter; flint; hornstone; basanite or touchstone; jasper.

Granular.—Granular quartz; quartzite; quartz-sand; quartz conglomerate; itacolumite or flexible sandstone, silicified wood.

2. *Opal.*—Precious opal; fire opal; girasol; common opal; cacholong; opal agate; hyalite; float stone; tripolite, etc.

3. *Highly-colored Stones, opaque (other than quartz).*—Lapis lazuli; rhodonite; jade, (white and colored;) precious serpentine; labradorite, malachite; chrysocolla; pipe-stones; meerschaum.

4. *Gems—Silicates, Phosphates.*—Garnets; carbuncles; pyrope; almandine; etc. Chrysolite; moonstone; sunstone; topaz; emerald; beryl; tourmaline, black, red, green, brown, etc. Zircon; hyacinth, chlorastrolite, etc. Turquoise.

5. *Gems—Oxyds.*—Corundum; ruby; sapphire; oriental amethyst; oriental topaz; oriental emerald; asteriated; spinel; ruby spinel; ceylonite; chlorospinel.

6. *Gems—Carbon Group.*—Diamonds in the rough and cut, black, blue, green,

yellow, and pink; bort carbon; diamond tools; diamond drills, etc. Jet, cannel coal, amber, etc.

V. BUILDING STONES, MARBLES, ETC.

1. *The hard Crystalline Rocks.*—Granite, syenite, gneiss, porphyry, trachyte, basalt, etc.

2. *Limestones, Marbles, Serpentine, etc.*—White crystalline and saccharoidal limestones; fine-grained amorphous limestones; limestones of various colors; marbles, white, black, and colored; statuary marble; stalagmitic marbles. Breccias, and compact calcareous or silicious conglomerates. Serpentine in all varieties.

3. *Sandstones, Conglomerates, Slates, etc.*—Compact silicious sandstones of various colors; freestone, brownstone, etc.; conglomerates; compact argillaceous sandstones. Slates for building, for walls, for pavements, and for roofing; black, purple, green, and red, of various sizes; for tables, billiard tables, wainscoting, blackboards, tubs, and various purposes.

4. *Decorative Stones for building, other than marble.*—Gypsum, alabaster, precious serpentine, agate, jasper, prase, rhodonite, malachite, etc.

(See also "Ornamental Stones and Gems.")

VI. ARTIFICIAL STONES, LIME, MORTARS, CEMENTS, ETC.

1. *Limes and Mortars*—Limestones and calcareous materials, raw and calcined, for preparation of mortar. Hydraulic lime; Theil lime.

2. *Cements.*—Cement stones and cement, pozzuolana, trass, Portland cement, Roman cement, etc.

3. *Gypsum.*—Gypsum, raw and boiled; plaster of Paris.

4. *Mastic, Bituminous Cements, etc,*—Bituminous or asphaltic cements and mixtures; asphaltic limestone.

5. *Artificial Stones, Concretes, etc*—Ransome's artificial stone, "apoenite," and mixtures; Frear stone; Schillinger stone, etc.

VII. FICTILE MATERIALS AND DIRECT PRODUCTS.

1. *Clays and Materials for Bricks, Tiles, and ordinary Potter's Ware.*—Brick clays, and brick of various colors and qualities. Tile clays and tiles, white and colored, encaustic and enameled. Fire clays, firebricks, and slabs. Stoneware clay, and mixtures. Potter's and pipe clay, and materials for ordinary white and colored ware.

2. *Porcelain Clays and Materials.*—Clays and mixtures suitable for porcelain; kaolin, silex, crude and ground; feldspar, crude and ground; ground bones, borax, cobalt, etc. Specimens of porcelain, plain and decorated.

3. *Glazes, Enamels and Colors for Potter's use.*—Vitrified examples.

4. *Glass, Glass-making, and Materials.*—Sand, silex, the alkalies, lime, manganese, borax, and metallic oxides, with examples of glass manufacture; cut and pressed glass; hammered glass; plate, window, and table glass; colored and stained glass.

5. *Graphite and Graphitic Mixtures.*—Crude graphite in the mass and pulverized, washed and refined. Stove polish and polishing graphite for shot and other articles of manufacture. Electrotyping graphite; photographer's graphite; lubricating graphite. Graphite and mixtures for crayons, pencils, etc. Graphite crucibles.

VIII. PIGMENTS, COLORS, DETERGENTS.

1. *Earthy substances.*—Ochres, boles, umber, sienna, etc. Chalk, whiting, prepared chalk, colored chalks, crayons. Barytes, crude and ground. Ultramarine, natural and artificial.

2. *Metallic Oxides and Compounds.*—Hematite and iron oxides; manganese, and other oxides. Vermillion, orpiment, realgar.

3. *For Cleaning, Scouring, etc.*—Fuller's earth, French chalk, steatite powder, etc.

IX. GRINDING, ABRADING, AND POLISHING SUBSTANCES

1. *Granular Substances of hardness less than that of Corundum.* Sand, quartz in grains and powder, garnets, crude topaz, etc.; bath brick, pumice stone, etc.; sand-paper.

2. *Corundum and Emery.*—Corundum and emery in the mass and crushed; emery of assorted sizes and grades, as prepared and sold for abrading purposes; emery cloth and emery paper. Emery wheels and emery tools.

3. *Grindstones, Millstones etc.*—Grindstones of various degress of fineness; gritstones, in the block and shaped; millstones; burrstones. Whetstones, scythestones, oilstones, and hones, in the rough and shaped for various purposes. Emery wheels. [See Corundum and Emery, 2.]

4. *Polishing Powders.*—Infusorial earth; rotten stone; tripoli; chalk; prepared chalk; whiting; rouge; tin oxyd, etc.

Burnishing Substances.—Hematite; bloodstone; agate; carnelian; jasper, etc.

X. FERTILIZING SUBSTANCES.

1. *Carbonaceous and Calxareous.*—Peat; muck; vegetable mold; lime; marls; chalk; gypsum.

2. *Phosphatic, Alkaline, and Saline.*—Mineral phosphates of lime, apatite, phosphorite, etc. Fossil bones and coprolites, crude and manufactured. Guanos, phosphatic, rain-washed, and ammoniacal. Salts of potash, soda, and ammonia. Green sand.

XI. SULPHUR, SALTS, AND MINERALS CHIEFLY USED IN CHEMICAL MANUFACTURES.

1. *Soluble Minerals.*—Salt; nitre of soda; nitre; carbonate of soda; sulphate of soda; Epsom salts; alums; green and blue vitriol; boracic acid; borax; Stassfurth compounds; mineral waters.

2. *Sulphur.*—Crude and crystallized sulphur; sulphur earth; refined sulphur; flowers of sulphur; red sulphur; pyrites used in manufacture of sulphuric acid.

3. *Miscellaneous Minerals, Chiefly used in the Chemical Arts.*—Cryolyte. Chrome ores and chromates. Zircons and zirconia and other rare earths; titanium, etc. Strontianite; fluorspar; tungstate, molybdates, etc.

SELECTION OF SPECIMENS.

In the circular of general directions for selecting, invoicing, packing, and forwarding specimens, the following instructions occur:

"In selecting the specimens, attention should always be given to their representative characters. They should, as nearly as possible, truthfully show the nature of the deposit or vein from which they are taken, as respects richness, average qualities, structure, and the mineralogical and geological association. If the average characters or peculiarities of a mineral deposit or vein cannot be shown by one specimen of the proper size, several specimens should be taken which shall, unitedly, represent all the important varieties and degrees of richness of the ore. The nature of the rock in which mineral deposits occur may be shown by specimens of the walls, especially in the case of veins or deposits in which the characters are more or less dependent upon the nature of the inclosing rocks."

The circular further states:

"Specimens should have clean, freshly broken surfaces, as nearly as possible across the grain or structure of the mass, so as to show the alternation of minerals and structure of the vein. Specimens of ores which are solid enough to permit of being trimmed into shape should be broken to one general size and shape, but exceptions are always to be made of specimens which would be injured by trimming. The size adopted is a little less than 6 inches square, so that the specimens can be placed in 6-inch trays without touching the sides. Specimens may be 5½ by 5½ inches, or 5 by 5 inches, or, where it is difficult to get pieces so large, two or more smaller specimens, sufficient to cover an equal space, may be substituted. When ores are friable, and cannot be obtained in solid masses, enough of the broken ore should be sent to cover a space equal to a specimen of the standard size. When it is not convenient to trim massive specimens into shape before packing, they may be sent entire, and can be trimmed just before they are arranged for exhibition. In general, it is best to select masses which have broad flat surfaces, and are not over two or three inches thick. The edges can then be broken off until the specimen has the required dimensions. Massive compact ores, like magnetic and specular iron ores, and some copper ores, can be broken into approximately rectangular blocks only a few inches thick, with flat surfaces, giving a form which can be conveniently arranged in cases or drawers.

"For metallurgical products no fixed rule can be given as to their form or size. They should, in general, be as compact as possible without sacrificing any of their value as illustrative examples. In selecting such products, as, for example, specimens of iron and of steel, regard should be had not only to their inherent qualities as dependent upon the nature of the ores and materials used, but also to the process employed, the quantity produced from a given plant, and the economy of the production. The tenacity, hardness, and other qualities may be shown by bent, twisted, and broken masses, and, if possible, suites of specimens which have been subjected to measured strains should be contributed, together with copies of the records of the experiments.

LABELING AND PACKING.

"Every specimen should be accompanied by a distinctly-written label, stating the nature of the specimen, its locality, and any important particulars connected with it that can be briefly stated. Printed blank labels for this purpose will be supplied. A lead-pencil should be used in preference to ink, for the latter, if wet, becomes illegible. The label should be folded up and placed next to the specimen, within the paper wrapping.

"All specimens should be securely wrapped in paper and then tightly stowed in strong boxes, which should be completely filled in order that there may not be any movement or rubbing of the specimens upon each other, whereby they would become worn and defaced. Friable delicate specimens, and choice crystallizations should be separately cased in small boxes, which can be packed in the larger boxes.

"It is very desirable that an invoice or list of the specimens should be made at the time they are packed in the box, a separate list being made out for each package. These lists should be transmitted by mail, and should bear the same numbers and marks as are placed upon the boxes. Each list should also state the time and place of shipment. Blanks for such lists and statements have been prepared, and will be sent to those who propose to forward specimens."

As respects iron ores and coal, special instructions are given by correspondence. It is in contemplation to secure some large cubical blocks of iron ore from the most celebrated beds and localities, and to obtain entire sections of coal seams showing the thickness and the alternations of shale and coal.

It is to be hoped that there will be a series of selections from the same coal bed commencing at the anthracite region and extending westward, showing the gradation from hard anthracite to soft anthracite, semi-bituminous and bituminous in veins of the same geological age. After being carefully cut out the section should be placed in a strong, tightly fitting box, from which the front can be removed when on exhibition, exposing about sixteen or eighteen inches of face, and as high, of course, as the thickness of the bed.

Blank forms and labels are supplied to those who wish to contribute specimens, and special instructions are given in regard to points of shipment upon the main lines of transportation. All packages of minerals and ores for the collection should be addressed to the National Museum, Smithsonian Institution, Washington, D. C., at which place they will be classified and catalogued, preparatory to being placed in the Exhibition at Philadelphia.

It is important that all contributions intended for the Exhibition should be forwarded during the summer of 1875. The work of arranging and the preparation of a catalogue will commence November first. All communications relating to the Collection should be addressed to Prof. W. P. BLAKE at New Haven, Conn.

Notes.

Wm. Taylor & Sons, whose advertisement will be found in another column, have for sale and ready for immediate delivery one 25 H. P., and one 40 H. P. engine suitable for hoisting purposes.

Railroads in Pennsylvania.—From the Auditor General's report for 1874, we learn that the total amount paid in on the capital stock of railroads in Pennsylvania was $482,931,393 50, and the funded debt $374,359,570 66.

A New device in Puddling at Dover, N. J., Rolling Mills, Although the lessees find some difficulty in obtaining good puddlers, the work at this mill is being carried forward in a way that evinces that they mean business. The muck bar iron which they are turning out is of the best quality, as is also the rolled iron—tests made with the latter showing that it is neither red nor cold short, but is strictly neutral iron.

When these mills were first started, what is known as the HARRIS & WILTHEW process was tried, but after expending from $1,000 to $1,200 in experiments which proved defective, the process was abandoned. Since then, however, COL. WYNKOOP has himself invented a new improvement upon this process, which is working splendidly and obviates all previous difficulties, and facilitates the work of the puddlers. It completely eliminates the carbon and expels the sulphur, and every heat thus far worked with it shows a loss of not over two per cent. in iron, whereas with the HARRIS & WILTHEW process the loss was from twelve to fifteen per cent. With it eight heats per day can be worked as easily as five heats by the old methods in common use, and with the same quantity of coal.

As soon as an efficient force of puddlers can be secured the mills will be worked night and day.—Dover *Iron Era*.

United States Exports and Imports for Fiscal Year Ending June 30, 1875.

THE detailed statement of the exports and imports of the United States for the fiscal year ending June 30, 1875, has just been issued by the Bureau of Statistics. Our total exports during the year amounted to $643,081,433, against $693,039,054 in 1874, a decline for last year of $49,957,621. The Chief of the Bureau of Statistics estimates the value of domestic merchandise exported to Canada in railroad cars, and not included in the above figures, at about $14,000,000, which would make the actual falling off about $36,000,000. Our imports for last year were valued at $553,906,253, as against $595,861,248 for the year previous, or a falling off, last year, of $41,954,905. The following are some items of particular interest to our readers :

EXPORTS.

	1875.	1874.	Increase.	Decrease.
Coal	$1,789,126	$2,236,084	....	$446,958
Brass, & manufactures of	1,000,629	503,531	$497,098	....
Iron " "	10,994,861	9,578,694	1,416,167	....
Steel " "	6,392,656	3,601,960	2,790,696	....
Quicksilver	1,075,796	580,221	475,575	....
Gold coin	59,309,770	28,766,943	30,532,827	....
Silver coin	5,115,670	4,555,418	560,252	....
Gold bullion	2,233,775	3,818,543	....	1,584,678
Silver "	17,197,914	22,498,782	....	5,300,687

IMPORTS.

	1875.	1874.	Increase.	Decrease.
Brass, & manufactures of	$295,439	$355,062	....	$59,623
Copper " "	527,310	422,745	....	104,565
Iron and steel "	18,676,250	33,993,546	....	15,317,296
Lead "	1,444,976	2,164,788	....	719,812
Tin "	13,038,353	13,064,702	....	26,349
Coal	1,798,689	1,950,425	....	151,736
Gold coin	12,115,155	17,888,468	....	5,773,313
Silver "	5,908,170	8,114,086	....	2,205,916
Gold bullion	1,581,638	1,614,669	....	33,031
Silver "	2,295,754	837,683	$458,071	....

The above is a very satisfactory exhibit. Iron and steel products show a gain of $4,206,863 in exports, and a falling off of $15,317,296 in imports, or a total improvement of $19,524,159. Our exports of steel and manufactures of steel increased 77 per cent. Our exports of coal show a falling off of $446,958, which is accounted for by the very low prices that have ruled in Great Britain. Our imports of coal have fallen off $151,736, but still exceed our exports. The greater amount of our imports of coal were to the Pacific coast, where the local coals are of inferior quality, and to which ports foreign vessels have had decided advantages in freights. Our exports of quicksilver have increased $475,575, or nearly doubled; and of brass and manufactures of brass, the increase has been $497,098, which is also about doubled. Our imports of tin differ but little in value from 1874, although the quantity was increased. Our imports of lead have fallen off about one-third.

Repairing the Upper Part of a Furnace Lining without Blowing Out.*

By FRANK FIRMSTONE, Glendon Iron Works.

WE found it necessary, last December, to repair the upper part of the lining in No. 5 furnace, at Glendon, and as we succeeded in doing it with comparatively little trouble, a description of the plan followed may be of service to those having a similar operation to perform.

On two opposite sides, as shown by the sketch, the lining was completely gone for a height of about4 feet, below which it increased gradually in thickness, being 9 inches thick about 3 feet lower down. On a plane at right angels to the section drawn, the brick were nowhere entirely gone, but were in some places not more than 2 or 3 inches thick, being still sufficient, however, to sustain the upper part, where the brick, being above the level of the stock, were not at all worn.

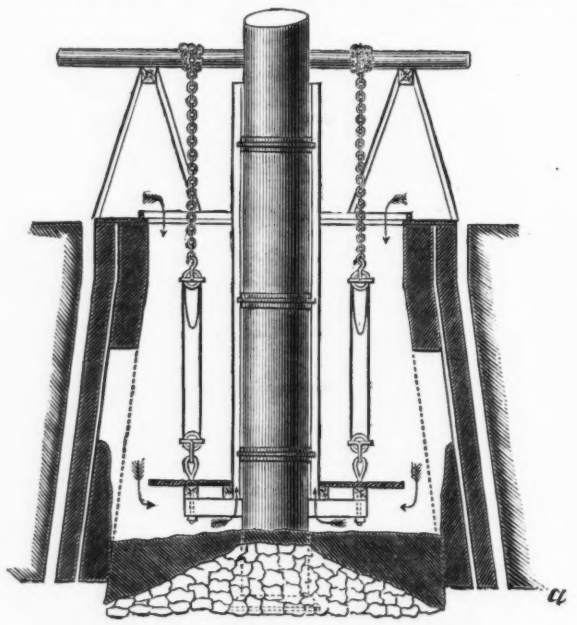
The furnace was blown down, so that when we cast and closed the tuyeres, about 7 A. M., on December 8, the top of the stock was about 24 feet below the filling plates. The walls were quite hot and a good deal of gas was given for several hours after the tuyeres were closed. The hopper and bell were thrown into the furnace, and were covered by filling several charges of cold stock over them, which at once greatly cooled off the top of the furnace. A wrought iron pipe, 30 inches in diameter, in five sections, each 6 feet long, was then put down, and made to stand upright, as nearly as possible in the center of the furnace. Around this, we filled a double charge of coal, taking care to heap it up next the pipe, and let it get thinner as it got to the walls. This was covered with about 2 feet of fine ore, leaving the first joint in the pipe entirely uncovered. We were now ready to put in our scaffold to get at the brickwork. The scaffold was made as shown in the sketch. It was 10 feet in diameter, and was suspended from two stout poles, (which reached across the top of the furnace and rested on two trestles, about 6 feet high) by four chains and four pair of differential blocks, whereby it could easily be raised and lowered as might be required. The frame of the scaffold, which had been well painted and sanded, was put together around the pipe in the center of the furnace, and was floored over with 2-inch plank, leaving a hole 3 feet 4 inches square in the middle. Four pieces of 3x4 scantling, 16 inches long, were nailed upright at the four corners of this opening, and by nailing sheet iron from post to post, were formed into a square chimney surrounding the pipe. By this arrangement, most of the gas was drawn off through the central pipe, which got pretty hot soon after it was put in, and at the same time the strong ascending current, in the space between the square chimney and the pipe, carried off any gas which might leak through the fine ore, and brought a stream of fresh air down past the faces of the men as they worked at the brick as shown by the arrows.

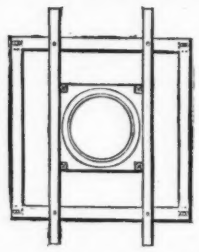
These arrangements were completed about 7 P. M., when the night shift of bricklayers came on.

We at first tried to build up the holes, intending to wedge up the top brick, which were still perfect, on the new work, and then cut out and rebuild the thin places, a little at a time. We soon found that we could not get base enough for this, and determined to take out all the old work from the top down, until we had from 6 inches to 9 inches to start on, and then rebuild, closing each course as we went.

Taking out these bricks was the hardest part of the job. They were, many of them, too hot to touch without hand-leathers, and the loam-filling between the front and back lining made a very thick dust.

After the top courses were out, we had to set props to prevent the lower brick





from falling in a mass. All the brick were out about 4 A. M. on the 9th, and at 6:30 A. M., the day shift of bricklayers began to rebuild, finishing about 10 P. M.

Cast iron angle plates, 1 inch thick, were built in at every joint, to cover the brick and prevent rapid wear in the future.

When the masonry was done we lowered the scaffold to the bottom, knocked off the chimney, and took the bolts out of the lower joint in the pipe. After the chimney was removed there was a slight smell of gas at the bottom, but the time spent in taking out the bolts was so short that no one got sick from it.

The scaffold and the upper part of the pipe were then hoisted out, leaving the lower section in the furnace, and the rest of the night was spent in sending down the pipe, etc., and clearing away for putting in the new bell and hopper. This was accomplished, and the blast put on by 3 P. M. of the 10th.

The furnace started without trouble, and although she slipped and worked irregularly for some weeks, she finally came to work very well, and the new part of the lining promises to last indefinitely.

* A paper read before the American Institute of Mining Engineers, at the Dover Meeting, May, 1875.

Preliminary Note upon the Carbonite, or So-called "Natural Coke" of Virginia.*

By HENRY WURTZ.

OBSERVING in the ENGINEERING AND MINING JOURNAL, of January 16, 1875, page 35, a report of a brief discussion upon the nature and origin of this unique and interesting coal, I take the liberty—on thus finding it a subject of interest to your Society, and especially as my name came into this discussion—to communicate some results which may serve at least to overthrow certain erroneous ideas that have prevailed.

While I would not claim to have made much approach to an *understanding* of this mineral—the whole of what I call Apozoic Mineralogy being as yet dark and almost unknown ground—yet I believe I have shown that few minerals of such importance and abundance, and so long before the world, have been so singularly *misunderstood*.

On first examination of a sample of the substance, my surprise was not small, at failing to recognize in it one individual characteristic of true coke; neither the hardness, lustre, color, streak, porosity, sonorosity, structure, fracture, nor any of the so-called "pyrognostic" characters. Indeed, comparison with any coke, or variety or modification thereof, seemed altogether fantastic. Therefore the controversy regarding supposed *trap-dykes*, whose existence is denied by some, seems useless, as we have no question of a natural coking, there having been no coking at all.

* A communication presented to the American Institute of Mining Engineers a the New Haven meeting, February, 1875.

Analysis made in the usual way practised with bituminous coals, gave me :

Water	0.44
Volatile combustible matter	14.08
Coke	77.17
Ash	8.31
	100.00

Deducting the water and ash, this corresponds to :

Coke	84.57
Volatile combustible	15.43
	100.00

On very slow and cautious heating, much of the volatile matter may be caused to escape and made to condense as an almost or quite colorless oil, mistakable for water, without much trouble, by a person making an incompetent examination. The streak of the mineral is brownish, with waxy lustre and the powder brownish. In fine powder it is readily dissolved by hot nitric acid to a red-brown liquid, after the habit of bituminous coal generally, and certainly unlike any conceivable coke.

DENSITY.—This was determined thrice, with some labor. The mineral had to be crushed to small fragments, and agitated at intervals for several days with the water in the specific gravity bottle, before all air was found to be expelled. The results were 1.351 and 1.397, none too close an agreement. The mean is 1.374. This much exceeds previous determinations, even if allowance be made for the larger ash in my samples. Such have been made, probably, on the mineral containing air in its pores.

I may have said enough for a preliminary note, and to establish my point; but may add a few words regarding one or two more facts of interest.

After the 0.44 per cent. of water had been expelled, from 10 grams of the finely pulverized mineral, by 12 hours on a water-bath, it was placed in a sand-bath heat, to determine any combined water. It began immediately to *increase* in weight, by oxidation ; and in 2 hours took up .0417, and in 60 hours (the heat being about equal to scorching paper), no less than .3597 of oxygen, or 3.36 per cent. of the original substance.

Another fact is that chloroform is colored yellow by carbonite, taking up from it a small but appreciable quantity of an aromatic resinoid constituent, doubtless descended to us from the original plant-mass, by whose metamorphism the carbonite was engendered.

DISCUSSION.

Mr. E. B. COXE remarked that an apparent discrepancy sometimes existed between the composition of coals, as shown by their chemical analyses and their practical value for heating purposes. It would seem that, in some cases, at least, chemical analysis did not tell us all we need to know of the value of coal.

Dr. T. STERRY HUNT—Dr. WURTZ mentions that only 0.44 per cent of water is driven off in the water-bath, and that when the coal is heated higher on a sand-bath, it begins to increase in weight. May it not be possible that this increase of weight, or absorption of oxygen, begins even at the temperature of the water-bath? WORMLEY gives instances where this is the case. It would seem to be requisite, in such instances, to heat the sample of coal in carbonic acid, or other non-oxidizing gas. It is curious, in this connection, to recall the work of the late Prof. SILLIMAN on the gas-yielding properties of coal, made forty years ago. He noticed that, whereas Pennsylvania anthracite gave as great a volume of gas as some bituminous coals, the illuminating power of the gas was very low, due to the water contained in the coal.

Mr. COXE inquired whether the carbonate formed a distinct and separate layer.

Dr. HUNT—Mr. HEINRICH stated, if I remember rightly, that this coal owed its peculiar character to the original conditions of its deposition, since it was underlaid and overlaid by ordinary bituminous coal. Thus, the formation of mineral charcoal, so called, is due to advanced carbonization before submergence. There is an instance in Silesia where an upper stratum of coal is much less bituminous than a lower—a condition of affairs the reverse of what would have been caused by internal heat.

WORMLEY has found, moreover, that the amount of water in samples of coal from the same bed of the Hocking Valley coal field varies considerably.

Erie's Coal Lands.

A NEW COAL COMPANY AUTHORIZED.

ON petition of HUGH J. JEWETT, Receiver of the Erie Railway Company, Judge WESTBROOK, in Supreme Court, Chambers, yesterday, made an order permitting the execution of a contract whereby the interests of the Erie Railway Company in Pennsylvania coal lands shall be consolidated with those of the Shawmut Company, the lands of which adjoin, and to some extent surround, those owned by Erie. This consolidation is permitted under the provisions of a contract whereby it is provided : (1.) That a mortgage is to be executed on the property so united to secure bonds to be issued to the amount of $4,000,000 ; the transfer by Mr. JEWETT, to the consolidated company, of the Erie interest, or, in other words, the entire stock of the North-western Mining and Exchange Company, to wit : 5,000 shares, in exchange for $1,366,667 of the said mortgage bonds at par, subject to the payment of the balance due on the purchase of the lands of the North-western Company, amounting to $544,080 96 ; the said Shawmut Company to receive a certain number of the said mortgage bonds in payment for its interest in the mortgaged premises. (2.) The consolidation of the Buffalo, Bradford and Pittsburgh Railroad Company, the Pittsburgh, Buffalo and Rochester Railroad Company, and the Brandy Camp Railroad Company (all of which facilitate the working of the lands) with a capital stock of such consolidated company amounting to $4,000,000 in shares of $100 each, whereof 22,990 shares, being a majority of the stock, is to be delivered to the Erie Railway Company, or the Receiver. The consolidated company is also to guarantee the payment of the principal and interest of the said $4,000,000 of bonds of said North-western Mining and Exchange Company. (3.) WILLIAM D. SHIPMAN is appointed Trustee to dispose of this $4,000,000 of bonds. (4.) The name to be assumed by this new consolidated company is the Pennsylvania and Erie Coal and Railway Company. (5.) The proceeds of the bonds, or so much as necessary, is to be used to construct a line of railroad to furnish an outlet to market for the coal, in connection with the roads already named. By this agreement, Mr. JEWETT claims, very great advantages are to be secured to Erie, including an abundant supply of coal for the use of the railway at reasonable rates, and substantially a monopoly of the right to receive from and transport all the freight and passengers carried over and going beyond the line of said Pennsylvania and Erie Coal and Railway Company. He is satisfied, moreover, that he will thereby make the best disposition of the stock which Erie at present holds in coal lands, and best serve the interests of the company's stockholders. The entire body of land, says the petition, which will be held by the consolidated company, will amount to 33,107 acres, containing immense deposits of bituminous coal of great value.—New York *Times*, Aug. 14.

Utilization of Iron Pyrites.

It is well known that the sulphur necessary for the manufacture of sulphuric acid was formerly obtained from Sicily in the native state. The export duties having been considerably increased, during the last twenty years, the attempt was made to supersede it; and this was successfully accomplished by means of iron pyrites, a mineral which is met with in great abundance. The extraction of these pyrites is only profitable, however, where they occur in large masses. The residues of pyrites contain so large a proportion of iron (40 per cent.), that in the single establishment of Meggen the loss thus occasioned amounts, annually, to more than a million and a quarter francs. These residues are, further, in such quantities, that there is difficulty in finding room for them. Dr. HOFMANN has succeeded in utilizing them on the large scale by the following process: The residues undergo a systematic washing, the temperature of the water being about 40° C. To the washings thus obtained, salt is added in the proportion of one equivalent for each equivalent of sulphuric acid present in the liquid. The result is sulphate of soda, which is separated by cooling and crystallization. This product has numerous industrial applications, especially in the glass trade and in the soda manufacture, and it is obtained in the present case in quantity sufficient to cover the cost of all the operations. The mother-liquors remaining after the sulphate of soda has been separated contain zinc-chloride, salt, sulphates of iron and of zinc, and a further quantity of sulphate of soda. By concentration to 54° B., the various salts are deposited, with the exception of the zinc chloride, which may then be separated. It has several industrial applications, and is sold in Germany at 18¾ francs per 100 kilos., and is chiefly used for preserving railway sleepers. Or it may be worked for metallic zinc, by being first treated with lime to convert it into zinc oxide. The residue from the last operation still contains the iron originally present in the pyrites, as also some sulphur. It is dried for some days in the open air, and the bulk of it crumbles to a powder, though there remain also compact fragments. Here is the most interesting phase of Dr. HOFMANN'S results on the pyrites of Meggen. It appears that the pulverulent portion is almost completely free from sulphur, while the fragments still retain considerable quantities. A simple process of sifting suffices to separate the part free from sulphur, which is then ready for metallurgical treatment as an iron ore.—*Les Mondes*, in *Chemical News*.

The Swansea Silver Smelting and Refining Works of Chicago.*

BY J. L. JERNEGAN, JR., M. E.

IN a former paper laid before the Institute, entitled Lead and Silver Smelting in Chicago, I endeavored to give a description of the manner in which argentiferous lead ores from the far West were treated in that city, and also described the method employed in the desilverization of the silver-lead produced from the ores. It will perhaps be remembered, that very siliceous ores, principally from the Emma mine, Utah, containing over 40 per cent. of silicic acid, were then being treated at the works of the Chicago Silver Smelting and Refining Company in the reverberatory furnace, with the use of metallic iron, in the form of borings, as a precipitating medium for the lead ; and that the extraction of the silver from the resulting bullion was affected by the Balbach process. The Swansea Works, also the works at Brighton, just outside of the city, and those of S. P. LUNT, were at that time treating ore of a similar character by the same method. The inadequacy of the process for the ores then under treatment was, in a manner, pointed out by me in the paper above referred to. Since the time of its writing, many, and important, improvements have been made in the metallurgical treatment of Western ores in Chicago. Most ores are now roasted previous to reduction, and the latter operation is conducted in the shaft-furnace instead of the reverberatory. Such is the fact at least at the Swansea Works, the largest in the city, and here it was where the first steps were taken in this direction. In selecting these works as the subject of this paper, I am in hopes that the description given of the various metallurgical operations, as they are there now conducted, will serve to give an idea of the improvements introduced within the last two years.

I would here acknowledge my obligations to Mr. N. A. COOK, Superintendent of the works, for valuable information kindly rendered.

The works are situated on what is known as the West Side of Chicago, occupying nearly a block on South Jefferson Street. Their location in the midst of a crowded business section of the city is, for numerous reasons, very unfavorable, among the most prominent of which may be mentioned the lack of sufficient space for a slag dump, necessitating the continual carting away of that product.

The following are the principal furnaces and apparatus : Two roasting furnaces, one of which is built in the style of the German *Fortschaufelungsofen*; the other is a revolving cylinder connecting with a slagging hearth ; two blast-furnaces of four tuyeres each ; four reverberatory smelting furnaces; one lead-softening furnace ; two small reverberatory furnaces for the reduction of lead dross ; two liquation furnaces, employed in separating the zinc-silver-lead alloy from the bullion after it has been mixed with zinc for the extraction of its silver; one lead-refining furnace ; eight tilting retort furnaces for distilling the zinc from the zinc-silver-lead alloy ; two English cupellation furnaces; a No. 9 Sturtevant blower, supplying blast to the shaft and cupellation furnaces ; ore-crushing machinery, consisting of an improved Blake's Crusher, two grinding mills, one ore screen, two Cornish rollers and belt elevators ; a 36 horse-power horizontal steam engine, taking steam from two tubular boilers, which furnishes the motive power for running the ore-crushing machinery, the Sturtevant blower and the revolving cylinder roaster.

The ore treated is mostly mined in Utah and Colorado, and is shipped to the city either over the Union or Kansas Pacific R. R.; freightage from Salt Lake City to Chicago amounts to $21 00 per ton. From the railroad depot the ore is carted to the works, the teamster receiving about $5 for hauling a car load, which is generally considered as amounting to ten tons, but is more often equal to about eleven. A good team is capable of hauling a car load from depot to works in four trips; the pay received per trip would therefore be $1 25. The low grade ores are shipped in bulk, the high grade packed in can-

* A paper read before the American Institute of Mining Engineers at the Dover meeting, May, 1875.

vas bags. On arriving at the works it is thrown from the carts onto the ore floor.

Ores.—The following were the principal ores treated during the months of August, September, October and November of 1874, to which space of time my remarks will be chiefly confine d :

So-called concentrated galena ore from Utah, mine unknown, consisting of almost pure galena with some iron pyrites, and yielding by fire assay from 65 to 70 per cent. lead, and from 10 to 15 oz. silver per ton.

Ore from Yosemite mine, Utah, an oxidized ore in part, often containing large and small nodules of galena. Sesquioxide of iron is present in the gangue in considerable quantities. Lead, from 40 to 50 per cent ; silver, from 10 to 15 oz.

Ore from Spanish Mine, Utah ; an oxidized ore containing about 35 per cent. silica, from 6 to 7 per cent. sesquioxide of iron and small amounts of alumina and lime. The lead is almost entirely present in the form of carbonate. From 30 to 35 per cent. lead, and about 15 oz. silver.

Ore from Galena Mine, Utah ; chiefly composed of argentiferous galena. Lead, from 45 to 55 per cent. ; silver, about 15 oz.

Small lot from San Juan District, Colorado; very silicious and carrying but very little lead, about 5 per cent., but assaying high in silver, with some gold.

Also small lots of high grade silver ores from Colorado, which are sometimes added to the roasting charge in small quantities for the purpose of increasing the amount of silver in the bullion to such a degree as to make it profitable for extraction.

Ore Crushing.—When necessary, the ore passes through a Blake's crusher. From the crusher it falls into a grinding mill, resembling in many respects a coffee mill, passing from here onto a screen, to which is imparted a jarring motion. That portion of the ore sufficiently fine to pass through is ready for roasting ; the portion composed of too large pieces to admit of its passage through the screen, is shaken off and into the shovels of a belt elevator, which conveys it up to, and discharges it between, two Cornish rollers revolving in different directions. The rollers complete the crushing. The finely crushed ore from the rollers is then conveyed to another belt elevator by means of a revolving Archimedean-like screw playing within a trough, the elevator conveying it to the hopper of a revolving cylinder roasting furnace, into which it is discharged. Two men only are required to attend the work of crushing ; one to feed the crusher, the other to tend the other machinery. They receive $1 50 per shift of twelve hours.

The method of metallurgical treatment, as practiced at these works, is a combination of the *roast-reduction* and *iron-reduction* process. The entire process may be divided into the following eight operations :

1. Roasting in long, reverberatory or cylinder roasting-furnaces.
2. Fusion and reduction of the roasted ore in blast furnaces.
3. Softening of the bullion resulting from the preceding operation in reverberatory furnaces, and after tapping off the charge into an iron kettle, mixing with zinc, in order to form an alloy of zinc, silver and lead.
4. Liquation of the bullion mixed with zinc in such a manner as to leave remaining on the hearth of the liquation furnace the alloy of zinc, silver and lead, the desilverized lead flowing from the furnace into a pot.
5. Treatment of the desilverized lead either in a kettle, with steam, or in a lead refining furnace, for the purpose of freeing it from zinc.
6. Distilling of the zinc-silver-lead alloy in retort furnaces, whereby the greater part of the zinc is expelled and there remains a rich silver-lead.
7. Cupellation of the rich silver-lead in English cupelling furnaces.
8. Refining of the silver obtained by cupellation of the rich silver-lead in graphite crucibles within the wind-furnaces of the assay laboratory.

Of late it has often been the practice to extract the silver from the bullion by the addition of three separate quantities of zinc, and skimming after each separate addition ; eliminating the zinc from the desilverized lead by steam, and draining the zinc-silver-lead alloy from excess of lead in a heated kettle ; thus entirely doing away with the liquating furnaces, and also effecting a much more perfect separation of the silver than by the former method of manipulation.

ROASTING.

Roasting, as conducted at these works, is classed under the head of slagging roasting, *i. e.*, the ore, after having been subjected to an oxidizing roasting in the cooler portion of the furnace, for the purpose of desulphurization, is fused at an increased temperature to a slag before being withdrawn. The slagging of the ore effects two important objects, viz.: the decomposition of any remaining sulphate salts present in the charge—the bases of the same combining with the silicic acid in the ore to form silicates, thus setting the sulphuric acid free—and the prevention of the formation of metallic fumes in the blast furnace, thereby avoiding the loss of much metal by volatilization. The latter point is of great importance, since the blast furnaces are not provided with dust chambers. When the roasting charge does not possess a sufficient amount of silica to form with the bases present an easily fusible slag, it has been customary to supply the deficiency by the addition of sand to the same after it arrives at the slagging hearth. The sand used for this purpose is brought from the lake shore at a cost of 30 cents per cubic yard. Sometimes, when the charge is composed of ores poor in silver, a few hundred pounds of high grade silver ore are added soon after the ore commences to fuse in the slagging hearth. The object is to increase the amount of silver in the bullion resulting from the next following operation of reduction of the roasted product in the blast-furnace. Without this increase of silver, the bullion produced from the low grade ores would not contain a sufficient amount to make the extraction of that metal from the lead profitable.

As previously mentioned, there are two roasting furnaces—varying, however, in construction. One is a single hearth, long reverberatory; the other is of peculiar construction, resembling in some respects the Brückner cylinder. The interior arrangement of the cylinder, however, is quite different from that of the Brückner furnace. The roasting cylinder also connects with a slagging hearth, into which the ore, after having passed through the former, is discharged and slagged, previous to removal from the furnace.

The single-hearth, long reverberatory roasting furnace is 26 feet long and 6 feet wide over all. It has eight working doors and a fire door, all situated on the one side. The two doors at either end of the roasting chamber are somewhat larger than the others—that at the flue end serving as a charging door, the one next the fire-bridge for drawing the charge from the furnace. All the working doors are provided with sheet-iron covers, with the exception of the slagging hearth door, which has a cover of cast iron. The side walls of the foundation are built of common brick, the interior space filled in with broken brick and mortar. The fire-box, hearth, and sides of roasting chamber are of fire brick, also arch spanning the roasting chamber from end of fire-box to within a short distance beyond the slagging hearth, but from this point on it is constructed of ordinary brick. As might well be expected, that part of the arch consisting of common brick is not capable of withstanding the effects of a high temperature for any great length of time, and must, therefore, often be renewed. It would certainly be cheaper in the end to make the entire arch with fire-proof material. The furnace is anchored with eighteen cast-iron bars placed vertically at equal intervals on either side, every two opposite connecting by means of wrought iron tie-rods passing over the arch. The erection of this roaster is said to have cost $1300.

A roasting charge for this furnace consists of from 800 to 1000 lb. of ore. There are six charges in the furnace at a time (4800 to 6000 lb.,=2 2-5 to 3 tons). Every three hours a charge is withdrawn, and, consequently, remains in the furnace eighteen hours. The total amount treated in twenty-four hours would, therefore, be between 3 1-5 to 4 tons. As much as 5 tons have been roasted within the same length of time when the ore was of such a character as not to require long-continued and careful manipulation. From 1500 to 1800 lb. of bituminous coal are consumed in twenty-four hours. This is at the rate of from 375 to 450 lb. per ton of ore roasted, assuming the amount of ore treated in this time to be 4 tons. Two men attend the furnace. The head roaster receives $1.75 and his helper $1.50 per shift of twelve hours.

The charge is made up on the floor in front of the furnace charging-door. For a long time it was composed of about one-half concentrated galena ore, and the remainder either of Spanish or Yosemite, or both.

TO BE CONTINUED.

Notes.

Improved Dumping Cages at use in the English Coal Mines.—These tippers consist of large iron cages fixed on the top of the banks so placed as to deliver the coal with as little breaking up as is possible. The cages revolve, and the bottom of each is so constructed as to be heavier than the top, so that it is self-righting. When a tub of coal comes up the bank from the shaft it is run into a cage. The banksman then, by a pressure of his foot, turns the cage upside down, and the contents of the tub are emptied upon an inclined surface and slide down to the trucks without much slack being cause i.

Hydraulic Onsetting Machinery for Mines, in use at Cider Hill Colliery, Nottingham, England. Mr. Fowler's hydraulic onsetting machinery, at the bottom of the shaft in pit No. 4. By this ingenious contrivance the empty cages which come down the shaft of the pit are pushed off, and the full ones are shunted into the places thus vacated by the movement of a ram which is actuated by hydraulic power. The movement is very rapidly effected, very simple in construction, and saves a good deal of manual labor. Mr. Fowler patented the process several years back, but it does not appear to be in general use, although its advantages are manifest, even to the uninitiated.

Decomposition of Salt by Superheated Steam.—An interesting experiment upon the decomposition of common salt by superheated steam is noticed in England, which may, in course of time, lead to important practical results. The experimenter found that by introducing salt into a jet of superheated steam and air, the result was th liberation of considerable volumes of hyd ochloric acid, and a residuum possessing a decided alkaline reaction. If the decomposition were complete, the result should be the production of hydrochloric acid and caustic soda, which would afford the simplest and most effective me'hod of manufacturing soda lye and the soda of commerce. In this case, however, the yield was far from being the theoretical one, though the result is highly suggestive.

Exports from Liverpool to the United States.—The following were the exports, of the items named, during July 1874 and 1875, from Liverpool to New York, Philadelphia, Boston and Baltimore :

		July 1874.	July 1875.
Sheets, bars, plates, etc.,	tons	442	1052
Railway iron	"	3723	....
Pig-iron	"	1461	200
Chain	"	66	221
Wire	"	110	65
Copper	"	....	25
Tin and terne plates,	boxes	120,372	55,627

The Contract for the Kanawha Lock.—The contract for building a lock on the Great Kanawha River, near Charleston, West Virginia, was awarded on Saturday (Aug. 14,) to D. M. & C. P. Dull of McVeyton, Penn. for $72,000. This firm was the lowest responsible bidder, the highest being E. D. Smith, of Philadelphia, whose bid was $273,000. The following are some items of the bid of the Dulls, with the corresponding items of the bid of Mr Smith, the highest bidder ; Extra for masonary under water, per cubic yard, Dulls, $2 30 ; Smith, $20. Timber and plank in place, per M , B. M., Dulls, $22 ; Smith, $30. Rough rubble laid, per cubic yard, Dulls, $4 ; Smith, $12. Dressed rubble laid, Dulls, $4 95 ; Smith, $14. Cut stone set, Dulls, $9 80 ; Smith, $24. Capping set, Dulls. $13 ; Smith, $30. Common excavation per cubic yard, Dulls, 22c. ; Smith, 50c. ; The work will soon be begun, and is to be completed by Nov. 30, 1876.

Wooden Linings for Furnaces.—Mr. C. W. Siemens, of Westminster, proposes some improvements in the construction of working furnaces for the production of iron, steel, and ferro-manganese, and in processes connected therewith. His invention relates to lining rotary and other reducing furnaces with blocks of wood, rendered incombustible in some cases by impregnation with metallic salts, and set in refractory mortar ; to constructing mid-feathers of furnaces with vertical air flues to keep them cool ; to arranging regenerative gas furnaces with pockets between the regenerators for collecting dust carried over by the products of combustion ; to mounting steel ingot moulds on a skeleton turn-table for facilitating the tapping of the metal ; to producing ferro-manganese in a rotative wood-lined furnace ; to reducing iron ore in the same ; and to the preliminary calcining of the ore with the application of salt and water vapor for aiding the liberation of phosphorus and sulphur.

Southern States Coal, Iron, and Land Co., capital, £100,000 in £100 shares, with powers s cured to increase this capital to £500,000, if necessary. This company is formed to purchase and develop certain large properties in Tennessee, U. S. A. Several mineral properties in the States have been examined by the agents of the promoters, and the present site has been fixed upon, as offering advantages not to be equalled. The estate is divided into three parts, viz., the "Battle Creek," or furnace site ; the "Cumberland Mountain," or coal property, and the "French Board," or iron ore lands. The first-named is 520 acres in extent, and is situated on the banks of the Tennessee, close to where a bed of mountain limestone, 200 feet thick, has been proved. The Cumberland property is 52,000 acres in extent. In this the coal would be mined entirely by drift ways, and thus no shafts would be required. The lowest seam of coal is 700 feet above the bottom of the valley, and under it lies a four-foot bed of fire clay. The iron ore lands comprise nearly 114,000 acres containing deposits of brown hematite and specular iron ores, yielding from 42 to 60 per cent. of metallic iron. They are free from sulphur, low in phosporus, and are sufficiently pure for the manufacture of steel. Manganese and lead ores are found on the estate, and all the land is heavily wooded. Mr. Thomas Whitwell (of the firm of W. Whitwell and Company, Thornaby Iron Works, Stockton) has personally examined the whole of the property, and speaks favorably of it. The entire purchase-money is £51,000, or 6/ an acre. Among the directors are Mr. William Barrett (of the Norton Iron Company); Mr. W. H. Hewlett (of the Wigan Coal and Iron Company); and Mr. J. S. Byers (director of the Stockton Iron Furnace Company.)

Practical Notes on the Management of Gas Works.*

CONTINUED FROM PAGE 132.

QUANTITY OF LIME REQUIRED.

One bushel of quicklime, when slacked and properly prepared for use, will have its bulk doubled, and will cover an area of 25 square feet, 2½ inches thick. No reliable instructions can be given as to the quantity of gas that can be purified by means of a certain quantity of lime, as it depends to some degree on the kind or quality of the coal or of the lime itself. Mr. CLEGG states that a bushel of quicklime will purify 10,000 cubic feet of gas—other engineers calculate on a bushel of lime for each ton of coal carbonized; at the Imperial Gas Works, London, a bushel of quicklime, costing 7d., purifies 10,000 cubic feet; at Cheltenham, 1½ bushels, costing 5d. to 6d. per bushel, are required for the same quantity; at Birmingham, where lias lime is used, the purification costs, for lime and labor, 1¼d. to 1½d. per 1000 cubic feet, and the refuse lime is sold for two-thirds of its original cost; and at Chester, where the carboniferous lime of the Flintshire coal fields is used, the purification costs 1s. per 1000 cubic feet for lime alone.

TESTING THE GAS FOR SULPHURETTED HYDROGEN.

The proper mode of ascertaining when the lime requires renewing is to test the quality of the purified gas every day by means of a solution of acetate of lead, commonly called sugar of lead, as follows:

SUGAR OF LEAD TEST.

Dissolve a small quantity of sugar of lead in distilled, or rain water, until it is of the consistence of cream, or thereabouts; dip into it a piece of writing paper, which hold a minute or two over the jet of purified gas; if the paper is not discolored, the gas may be considered as pure; but if a brown stain is imparted to it, the lime in the purifiers, or in the one through which the gas first passes, must be renewed—the darker the stain, the more impure is the gas. The discoloration of the paper is owing to the fact that the acid has a great affinity for the sulphur in the gas, and parts with the lead in solution, which, consequently, appears in a state of minute division on the test paper. As this preparation of lead is an active poison, it must be labelled "Poison," and used with caution. A small cupboard should be provided for the test bottle, paper, etc., and a test-cock should also be fixed on the outlet pipe from the purifiers, for testing purposes.

Mr. CLEGG recommends that test paper should be applied every day to the gas which has passed through each of the purifiers in use, and also to the unpurified gas; also that the test papers should be printed in squares, marked for each kind of gas. The test papers should be wetted with the test solution immediately before using, and if they are desired to be preserved, they should be kept in a book for that purpose, or otherwise excluded from the light.

NITRATE OF SILVER TEST.

A solution of nitrate of silver and distilled water, made by adding four grains of nitrate of silver to two ounces of the water, is a more delicate test than the above; where it is used, the vessel in which it is kept should be coated with tin foil, to preserve it from the action of the light, which turns the solution black; the shades of color are produced by a similar decomposition to that which takes place when using a solution of acetate of lead, the silver being, in this case, deposited on the surface of the paper. The sugar of lead test is, however, sufficient for all practical purposes.

TEST FOR AMMONIA.

A test for *Ammonia* is as follows:—Apply either litmus paper or yellow turmeric paper, reddened by vinegar or any other weak acid, to a jet of gas; if the blue color of the litmus paper returns, or the color of the turmeric paper deepens to a brown, the gas contains a proportionate amount of ammonia.

TESTS FOR CARBONIC ACID.

Carbonic Acid may be detected by adding to water impregnated with the gas, a few drops of sulphuric acid, when minute air bubbles of carbonic acid gas will be rapidly disengaged. Another test is to pass the gas through a solution of pure barytes in the blue tincture of litmus, when, if carbonic acid be present, carbonate of barytes will be precipitated.

TEST FOR BISULPHIDE OF CARBON.

Bisulphide of Carbon.—By forcing, by means of an ordinary blow-pipe, the flame of coal gas for about a minute on to distilled water containing a little acid chloride of barium, sulphate of baryta is formed, and the presence of sulphur in the gas thus proved.

TESTS FOR ATMOSPHERIC AIR.

Atmospheric Air.—Its presence in gas may be readily detected by collecting a portion of the gas over mercury and then passing up first a few drops of caustic potassa, and afterwards a drop or two of a solution of pyrogallic acid. If the liquid assume a blood-red hue, oxygen, indicating the presence of atmospheric air, is mixed with the gas.

Another test is as follows:—Take a two-necked pint bottle, and fit the necks with corks, to receive each a small glass tube. Into this bottle put, first, half an ounce of anhydrous sulphate of manganese, previously dissolved in one ounce of warm water; then add two ounces of tartarized soda, also previously dissolved in three ounces of warm water; when these are well mixed together, pour in half a pint of caustic solution of potash, and agitate the whole so as to form a clear solution. After this, fix in the corks as rapidly as possible, in order to exclude the air, and push one of the glass tubes down just below the surface of the liquid, leaving the other with its open end inside the bottle near the cork; all that is now required, is to cause a constant stream of the gas, at the rate of about one cubic foot per hour, to pass through the fluid in the bottle, by means of the two glass tubes. At the beginning the fluid is clear and almost as colorless as water, and with pure gas will so remain; but if it be exposed to the air, or if the coal gas passing through it be mixed with air or with oxygen, the fluid speedily becomes of dark brown hue, and ultimately assumes the appearance of strong porter or writing ink. This change arises from the fact that the colorless protoxide of manganese is changed into the black hydrated sesquioxide, by the agency of the oxygen in the air. Tartarized soda is commonly known by the name of Rochelle Salt, and the solution of potash is the fluid known as liquor potassæ, and employed by medical men.

THICKNESS OF LIME ON THE SIEVES.

A thickness of 2½ inches of lime on the purifier grids is found to be the best in practice, except in the case of very small purifiers, giving a comparatively small area for the gas to act upon, when the lime should be from 1½ to 2 inches thick, according to circumstances.

* From notes compiled by W. C. HOLMES & Co., Engineers and Contractors of Gas Works, Huddersfield, England. We shall be pleased to hear from our managers of gas works as to the way they do these things, and wherein our ways are improvements on the English.

RENEWING THE LIME.

When the lime requires to be renewed, the first one of the series through which the gas passes is shut off by means of the change valve or valves, and the gas is then first passed into the purifier which was previously the second in the series, and finally leaves when it has passed through the purifier in which the lime had been last renewed. Where two purifiers are fixed, immediately on the conclusion of the operation of renewing the lime in either of them, the gas should be caused to pass through both of them in succession. Where four purifiers are employed, it is usual to have three of them always in work, whilst the fourth is shut off, to have its charge of lime renewed. When only one purifier is fixed, as is frequently the case in small private works, a little discretion is necessary as to the best time for renewal of the lime, which should be when the gasholder is full and when it is not necessary to be making gas; in this case, the valve between the purifier and the gasholder must be closed, or the gas will return from the holder into the purifier, and an accident, in all probability, will occur.

ATTENTION TO WORKING OF CENTER CHANGE VALVES.

When a center change valve is used, attention must be particularly paid to the mode of working it, so that no mistakes may occur—the manner of working them will, of course, vary with the description of valve used.

CENTER CHANGE VALVES.

"For working two, three, or four purifiers, one center change valve is far preferable to having a number of slide valves. In a case where slide valves are used, if the attendant were to shut off those leading to the spent purifier before he opened the others, the consequence might be serious; the sudden check thus given to the passage of the gas from the retorts would drive the tar from the hydraulic main down the upright pipes into the open retort, if there were any not in use, and most probably do much injury: several accidents have arisen from this cause. With one valve this cannot occur, as it is impossible to close one partition without opening another."

Center change valves for four purifiers are now so constructed that the gas may be passed through the whole of them in succession, when the lime does not require renewal, thus virtually increasing considerably the available purifying surface.

COMBINED APPARATUS.

The foregoing remarks apply equally to apparatus which combines a condenser, scrubber, and purifier or purifiers, together in one vessel. The lower part of the vessel must be cleaned out frequently, and the syphons kept clear, so that the flow from them may be uninterrupted.

PRECAUTION AS TO PURIFIER HOUSE.

The purifier house should not be entered with a light, without taking proper precautions to prevent accident.

CARE OF STATION METER.

The indications of the station meter should be taken at a certain given hour in the morning, say seven o'clock, and noted down in the carbonizing book. The water level should also be adjusted at the same time, as it is apt to vary from evaporation or deposition from the gas; the water should also be renewed once or twice a year. If a tell-tale is attached, a fresh disc should be provided at the same time that the register of the meter is taken, and the one removed preserved for after-reference or examination: an inspection of these papers will show the manager or superintendent whether the production of gas has been regular and progressive at all hours of the day and night, and supplies a good check on the operations of the workmen.

CARE OF GASHOLDERS.

Little needs to be said respecting the gasholder or gasholders, being merely vessels for storing up the gas as it is generated and purified, and media for its after-distribution. The guide-rollers, chains, and pullies, must be kept in working order, and so that the holders are free to move up and down without stoppage or "sticking." The holders, columns, etc., should have a coating of boiled tar every summer, the better to preserve them.

QUANTITY OF GAS IN HOLDERS.

As it is an advantage in some respects, and more especially in small works, to know the quantity of gas stored in the holders on any given day, it should be taken note of when the register of the station meter is taken. This may be readily done by the use of a wooden rod of the same length as the depth of the holders, and divided into parts corresponding to 50 or 100 cubic feet of their contents, thus:—Supposing the gasholder is 10 feet deep, and contains 5000 cubic feet; the rod being 10 feet long should be subdivided into 50 parts of 100 cubic feet each; the end of the rod being placed at the level of the water in the tank, the quantity of gas contained in the holder can be read off at once, the rise of the crown not being taken into account.

GENERAL REMARKS AS TO STOPPAGES OR OBSTRUCTIONS.

If, whilst the gas is being generated in the retorts, the tar does not flow from the syphon attached to the hydraulic main, or the passage of the gas to the purifiers is obstructed from some cause or other, the retort doors should be at once slackened in order to take off the pressure; the obstruction may arise from the making up of the upright pipe, or of the pipe leading into the hydraulic main; an obstruction in the syphon of the hydraulic main, or in the pipes between the hydraulic main and the condenser; an obstruction may have occurred in the condenser, washer, scrubber, exhauster, purifiers, station meter valves, connecting pipes, or the syphon boxes, including those in the gasholder tanks, or from the "sticking" of the gasholder, owing to the friction or displacement of the guide-rollers, etc. If the obstruction is beyond the purifiers in action, the lutes will, in all probability, "blow," as will also the syphon-boxes between them and the hydraulic main, according to the depth of seal possessed by them; the greater the number of syphons which are affected the more removed will be the obstruction from the retort stack. The remedies will generally suggest themselves; a good indication of the working of the apparatus is afforded by the sounds caused by the passing of the gas through the fluid in the hydraulic main; if the ebullition is heard to be regular and steady, it is more than probable that no obstruction exists; but if it is violent and irregular, or not heard at all, it may be taken at once for granted that there is a stoppage.

DEPOSITION OF NAPHTHALINE.

A frequent cause of stoppage is the deposition of naphthaline in the pipes; where this substance is likely to be troublesome, the pipe leading from the hydraulic main to the condenser should be prolonged, so as to keep the gas, etc., in contact with the coal-tar, which contains naphtha, as much as possible, coal naphtha having a great affinity for it; coal naphtha may also be used for this purpose in the scrubber instead of water, the syphons of the scrubber being so arranged, that the naphtha can be pumped up again and re-used; if, how-

ever, as sometimes happens, the naphthaline has been deposited in an inaccessible place, such as the pipes leading into the gasholders, there is no alternative but to attach a steam pipe from a boiler and dissolve it. In works where an exhauster is employed, actuated by a steam engine, there will be little difficulty in so doing.

PORTABLE STEAM BOILER.

A valuable adjunct to a works making three or four millions of cubic feet per annum and upwards is a small portable steam boiler, which may be used on occasions of this kind, and also for clearing the condensing tubes and other parts of the apparatus periodically.

BY-PASS VALVES.

In order to avoid the necessity of slackening the retort doors, as much as possible, the scrubber or washer, the exhauster, and the station meter, should be provided with by-pass valves, so that the gas may be diverted from any of these parts of the apparatus in case of stoppage.

SYPHONS.

All syphons should be examined carefully and regularly at least once a week, to ascertain if they are in working order.

TO BE CONTINUED.

CORRESPONDENCE.

Lowe's Gas.

MONTCLAIR, N. J, August 11, 1875.

TO THE EDITOR: Sir—Regarding the inquiries made by Mr. BATTIN, Superintendent of the Albany Gas Light Co., concerning the "Lowe process," allow me to say that the proportion of carbonic oxide produced by that method is not sufficient to justify apprehension. What the exact proportion is I am at present unable to say, but will give it as soon as determined by analyses we are about having made. It is not, however, greatly in excess of that found in ordinary illuminating gas, and since the escape of this Lowe, like any other lighting gas, is readily noticed by its smell, the small amount in the air, before the senses gave notice of its presence, would not be sufficient to cause inconvenience. Certainly, all producers must be interested in preserving their consumers, and it would undoubtedly be desirable if all objectionable constituents could be excluded from illuminating gas; but what process has yet achieved such a degree of perfection? It is claimed for the new method that with less mechanical and chemical objections, it furnishes a superior quality of light at less cost than the old, and these points are now demonstrated on a practical working scale. I shall be pleased to answer any inquiries upon the subject, either through your colums or by correspondence addressed to

GEO S. DWIGHT, Montclair, N. J.

NEW PUBLICATIONS.

ROPER'S HANDBOOK OF LAND AND MARINE ENGINES. By STEPHEN ROPER. Philadelphia: Published by CLAXTON, REMSEN & HAFFELFINGER. Price $3 50.

THE general purpose of the book is fully set forth in the author's preface as being "a concise compendium of engineering facts, to which the practical engineer can refer with confidence, for information regarding every branch of his profession."

The most eminent scholars in presenting to the public a treatise upon a subject with which they are especially familiar, usually preface the work with a profuse apology for its shortcomings; thus, in closing a lecture upon the existence of a limit to vaporization, the late Prof. FARADAY remarks, "I refrain from extending these views, as might easily be done," * * * "being rather desirous that they should first obtain the sanction or correction of scientific men." And yet, at the time (1826) Prof. FARADAY had few or no superiors in his profession.

No such superfluous modesty oppresses the author of this handbook of engines, but he rushes in with proverbial assurance where wiser men have feared to tread.

Undoubtedly, Mr. ROPER possesses an extensive practical knowledge of steam machinery, and we are far from undervaluing the importance of a practical acquaintance with the subjects on which an author treats; but it is also very true that so-called "practical men" are often unacquainted with the fundamental laws which govern the phenomena so familiar to them. Though the author of this hand-book has a certain acquaintance with the science or theory of steam engineering, his familiarity is not such as to make his compendium at all the safe guide his title-page affirms it to be. Such attempts as he makes at a scientific disquisition upon the theory of engineering, are peculiarly hazy and uncertain in their meaning, and to the class of men to which the work is directed will work much injury, inculcating erroneous ideas upon the value of the very elements of steam engineering as an exact science. Typical of these errors, on page 28 we find, "*Steam, in whatever state it may exist, must possess at least 212 degrees of heat.*" This, of course, refers to sensible heat, and implies that steam, at an absolute pressure of 4 or 5 pounds per square inch, as in its use in the condensing engine, possesses a sensible heat of 212° F. Again, "*this quantity of heat, 212° F., is sufficient to maintain it (the steam) in the vaporous form, under whatever pressure it may be placed,*" which is, of course, no more correct than it would be to say, a "horse power" is the power capable of raising 33,000 lb. one foot high, without limiting the time to *one minute.* Scientific works, in point of accuracy, should follow each other in regular sequence, and the last should be the best. There are many very good points in the book, particularly those devoted to the management and care of steam machinery, and if it had rested there it would have been of greater value. We cannot look upon it as a work "to which the practical engineer can refer with confidence for information regarding every branch of his profession;" at least, his confidence will suffer some shocks, should he try to apply the information he gets in practice. Nevertheless, the book will well repay perusal by the thoughtful mechanic.

The general plan is novel, and the publishers' part of the work excellent.

SCRIBNER'S MONTHLY, for September.

Those that know SCRIBNER'S do not need to be told that it is one of the best periodicals published in this country, and those that do not know that magazine—if any such there be—should at once take it. The September number has several very interesting articles.

POPULAR SCIENCE MONTHLY.

This excellent publication continues the good work of popularizing science. It does this in the September number in excellent articles on Scientific Culture, Fresh Water Mollusks, The Deeper Harmonies of Science and Religion, Tempered Glass, House Ventilation, etc., etc.

STEIGER'S CLASSIFIED CATALOGUE of American, British, German, and French periodicals, in the departments of commerce, science and arts, is a very useful publication, which will be mailed *free* to any one applying for it to E. STEIGER, Bookseller, etc., New York.

Prices of Metals.

BY H. C. BOLTON, PH. D.

A paragraph bearing the above title has of late circulated extensively among scientific and pseudo-scientific papers, the original of which we have been unable to trace. The paragraph referred to gives the price per pound avoirdupois of twenty-eight metals, beginning with indium, which is valued at $2520 per pound, followed by vanadium, ruthenium, etc., and terminating, of course, with iron. As it has reached us no authorities for the prices are given, nor is any statement made as to the sources of the information communicated.

The table abounds in gross errors, which has induced me to recalculate the prices, and at the same time to extend the list. Of course, the prices vary considerably according to the dealer and the country, whether Europe or America. The prices of many of the dearest may be considered also as "fancy prices," and actually a whole pound of some of the metals named could hardly be obtained at even the extravagant figures annexed. In compiling the following table we have taken the prices of the rarer metals from TROMMSDORFF'S and SCHUCHARDT'S last price-lists; we have assumed the avoirdupois pound as equal to 453 grammes, and the *mark* as equal to 24 cents gold.

An inspection of the table is not without interest; it is evident that the prices of the metals bear no relation to the rarity of the bodies whence they may be derived; for calcium, the third in the list, is one of the most abundant elements. Even that excessively sparingly distributed metal indium, the most recently discovered element, stands tenth in the list, below strontium. The metals of the alkalies seem to occupy a remarkably low place in the table.

S. and T. annexed to the price per gramme stand for SCHUCHARDT and TROMMSDORFF respectively, and indicate the source of the data.

Metal.	State	Value in gold per lb. avoirdupois.	Price in gold per gramme.	Authority.
Vanadium,	cryst. fused,	$4792·40	$10·80	S.
Rubidium,	wire,	3261·60	7·20	S.
Calcium,	electrolytic,	2446·20	5·40	S.
Tantalum,	pure,	2446·20	5·40	S.
Cerium,	fused globules,	2446·20	5·40	S.
Lithium,	globules,	2228·76	4·92	S.
Lithium,	wire,	2935·44	6·48	S.
Erbium,	fused,	1671·57	3·96	S.
Didymium,	"	1630·08	3·60	S.
Strontium,	electrolytic,	1576·44	3·48	S.
Indium,	pure,	1522·08	3·36	T.
Ruthenium,		1304·64	2·88	T.
Columbium,	fused,	1250·28	2·76	S.
Rhodium,		1032·84	2·28	T.
Barium,	electrolytic,	924·12	2·04	S.
Thallium,		738·39	1·63	T.
Osmium,		652·32	1·44	T.
Palladium,		498·30	1·10	T.
Iridium,		466·59	1·03	T.
Uranium,		434·88	·96	T.
Gold,		299·72		
Titanium,	fused,	239·80	·52	
Tellurium,	"	196·20	·43	
Chromium,	"	196·20	·43	
Platinum,	"	122·31	·27	
Manganese,	"	108·72	·24	T.
Molybdenum,		54·34	·12	T.
Magnesium,	wire and tape,	45·30	·10	T.
Potassium,	globules,	22·65	·05	T.
Silver,		18·60		
Aluminium,	bar.	16·30	·036	S.
Cobalt,	cubes,	12·68	·028	S.
Nickel,	"	3·80	·008	T.
Cadmium,		3·26	·007	T.
Sodium,		3·26	·007	T.
Bismuth,	crude,	1·95	·0043	S.
Mercury,		1·00		
Antimony,		·36	} Prices taken from recent quotations.	T.
Tin,		·25		
Copper,		·22		
Arsenic,		·15		
Zinc,		·10		
Lead,		·06		
Iron,		·01½		

—*Am. Chemist.*

The New York Belting and Packing Co. has gained its suit against the Gutta Percha and Rubber Manufacturing Co. for infringement of a patent granted, in 1859, to THOMAS J. MAYALL, of Boston, on the use of crude carbolic acid as a preservative of the canvas used in making rubber hose. This suit has been carried on for some time; the infringement, it is said, having commenced some ten years ago. This, and other cases of a similar kind, have tended to bring the administration of the Patent Office into great disrepute. A reasonable degree of vigilance and fairness would have prevented this tedious and expensive suit. The NEW YORK PACKING AND BELTING CO., whose card will be found in another column, is one of the largest manufacturers of vulcanized rubber goods in the country, and has won a high reputation for its belting, water hose, steam packing, car springs, etc., etc.,

The Atlantic Steam Engine Works., Brooklyn, N. Y., are building on contract for the United States two screw pile iron light houses of the largest size; one is to be placed at Port Tobacco and the other at Thomas Point, Md. They are said to be fine specimens of workmanship.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Aug. 14:

	1875.		1874.	
	Week.	Year.*	Week.	Year.
Wyoming Region.				
D. and H. Canal Co.	64,126	1,963,992	34,298	1,457,122
D. L. and W. RR. Co.	73,617	2,137,865	32,088	1,512,779
Penn. Coal Co	30,832	818,064	28,858	787,622
L. V. RR. Co.	21,583	548,201	18,789	612,738
P. and N. Y. RR. Co.	994	69,450	886	38,111
C. RR. of N. J.	47,607	574,534	40,227	822,884
Penn. Canal	18,314	97,591	6,546	185,045
Lack. and B. RR.	..	81,493	..	112,529
	257,133	6,291,190	161,692	5,528,830
Lehigh Region.				
L. V. RR. Co	85,398	651,381	57 424	1,929,380
C. RR. of N. J.	38,040	213,285	24,669	641,739
D. H. and W. B. RR.	1,154	45,527	975	21,781
	124,592	910,193	82,468	2,592,900
Schuylkill Region.				
P. and R. R. RR. Co.	179,003	1,888 163	120,793	2,959,216
Shamokin and Lykens Val.	33,698	736,092	25,201	542,864
	212,701	2,625,255	145,994	3,502,080
Sullivan Region.				
Sul. and Erie RR. Co.	..	5,557	858	22,301
Total	594,426	9,832,19	391,012	11,646,111
Increase	203,414	..	..	..
Decrease	..	1,813,916	..	..

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

The following Table does not give the entire production of our Bituminous mines, but it is by far the fullest report published.

The Production of Bituminous Coal for the week ending Aug. 14, was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2,240 lb.	51,711	1,381,059
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb.	8,679	189,789
Broad Top Region, Pa.		
Huntingdon and Broad Top RR.	5,230	137,233
*East Broad Top	539	27,379
Clearfield Region, Pa.		
*Snow Shoe	1,205	41,902
*Tyrone and Clearfield	16,845	502,233
Allegheny Region, Pa.		
*Pennsylvania RR	2,964	141,652
Pittsburgh Region, Pa.		
*West Penn. RR	3,079	127,961
*Southwest Penn. RR	252	5,544
*Penn. & Westmoreland gas coal, Pa. RR.	19,994	362,046
*Pennsylvania RR	8,907	240,290
Kanawha Region, W. Va.		
Chesapeake and Ohio RR	3,205	100,518

* To Aug. 7.

The Production of Coke for the week ending Aug. 7.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	273
Alleghany Region	..	53
West Penn. RR	847	31,076
Southwest Penn. RR	8,548	312,104
Penn. & Westmoreland Region, Penn. RR.	1,265	19,488
Pittsburgh, Penn. RR	1,896	60,984
Total	12,566	423,978

Bituminous Coal Production to Aug. 1st, 1875.

The following does not include the total production, but such quantities as have been reported to this office:

Pennsylvania	5,349,651
Ohio	380,188
Maryland	1,434,098
Illinois	484,673
Indiana	26,041
Iowa	52,094
Wyoming	80,346
West Virginia	96,038
Tennessee	43,087
Alabama	28,269
Colorado	12,504
	7,986,989

The receipts at Port Richmond for the week were 75,000 tons, shipments 75,000 tons, and balance on hand 55,000 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania Railroads amounts to 73,411 tons.

The Exports of Coal from Baltimore for the week were 000 tons, and for the year, 28,411 tons as compared with 56,519 tons to the corresponding time in 1874.

The receipts at Buffalo, via L. S. and M. S. RR. for the week were 1,760 tons. The exports by Lake were 20,708 tons, and imports 1,001 tons.

Belvidere Delaware RR. report:

	Week.	Year 1875.	Year 1874.
The receipts of coal at Coal Port (Tr'ton)	7,950	47,036	171 501
" " " South Amboy	16,249	80,034	413,724
Shipments of Coal Port (Trenton)	7,906	44,480	172,664
" South Amboy	10,226	135,018	391,501

Receipts of coal at Boston, for week ending Aug. 13, and year from September 1st, 1874.

From	Week. Tons.	Previously Tons.	1874. Tons.
Alexandria	2,912	75,476	83,774
Georgetown	1,078	22,997	20,911
Philadelphia	27,784	447,393	570,110
Baltimore	6,848	158,739	230,463
Other places	10,400	234,487	201,200
Great Britain	....	2,224	3,469
Nova Scotia	1,128	26,195	75,605

Shipments from Pictou, N. S, for the week ending July 10:

	Tons. Week.	Year.
To United States	3544	12,089
" West Indies	—	1107
" South America	—	1002
" Canada	4860	70,091
" Other Provinces	1221	24,153
	9,625	108,442

Shipments from the Block House, Cow Bay, C. B., to the following destinations, from Aug. 1 to Aug. 11, 1875:

	Week.	Year.
Provinces	1007	4386
West Indies	..	806
United Stated	1303	4323
	2310	9515

COAL TRADE REVIEW.

Duties.

Anthracite free, *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c. gold.

Not otherwise provided for, per ton, 40c. gold.

NEW YORK, Friday Evening, Aug. 20, 1875.

Anthracite.

Lehigh and the hard Schuylkill coals continue in good request, while the softer varieties are in very light demand, with not very encouraging prospects. An improved demand will probably set in later in the season, but there are doubts of its being so great as that which occurred last year. We still hear of a certain amount of underselling by contractors, but it does not appear to bring business.

Last week we made mention of an arrangement to equalize freights on coal going around Cape Cod. As remarked at that time, shipments from Philadelphia to Boston have had an advantage of 15c. per ton over shipments from this city. The plan adopted to temporarily remedy this, is to charter a vessel at 15c. a ton less than the established price, the shipper handing the captain a check to make up the difference. This plan the companies shipping from New York do not approve of. The Lehigh Companies were not consulted on the existing arrangement, and will probably ask for the establishment of prices in Philadelphia which will cover this difference in freights. The other companies will probably join in the same request. This irregularity of freights may necessitate a sliding scale of prices, for freights may advance or decline at either port immediately after establishing prices and leave one or the other of the companies at a disadvantage for a whole month. Such difficulties will inevitably occur where only this chance of competition is left open, and they suggests a "pooling" of the whole Combination production; each company putting in its proportion of coal, and orders being distributed upon that basis, with a minimum price list; this would be a kind of consolidation or crystallization of the combination. It does not appear to be just that one company should have an advantage on some Eastern shipments or another on the North River trade. The principle of "equalizing allowances" on coal sold at competetive points is not a sound one, and if permitted may be used to effect other objects than those intended.

The Philadelphia and Reading Railroad Company has issued a circular to the ironmasters on the line of the road, offering to furnish them with coal, ore and limestone, and take the pig iron from them, simply paying them for smelting. If carried out, this plan would certainly increase the consumption of Schuylkill coal; but, unless a foreign outlet be found for the iron produced, the market would be still further overstocked, and other furnaces would have to blow out, thereby reducing the consumption of other coals. This policy might then be followed by other companies.

In seeking a foreign market we would have low figures to compete against. Scotch iron, such as is used in this country, is quoted f. o. b. Glasgow at figures equal to $16@$20 American currency. If the railroad company should commence ore—as well as coal mining on a large scale, and with the most approved appliances, and should follow out the policy expressed in the argument lately made by Mr. GOWEN, there is little doubt that we would see iron sold f. o. b. at Philadelphia at figures that would enable us to enter many foreign markets, and the whole valley of the Schuylkill would witness an unexampled activity in all branches of trade, while the railroad company would be largely the gainer in the end

The question is so important that we will devote more space to it in our next.

The production last week shows an increase of about 30,000 tons over the previous week, and about 200,000 tons over the corresponding week of 1874. The decrease since January 1st, as compared with the corresponding period of 1874, is 1,813,916 tons. The present large output is more than the trade requires, and stocks are accumulating.

At the meeting of the companies to-day, Mr. GOWEN and Mr. DICKSON being absent, the settlement of a plan on which to provide for an equalization of freights was postponed to a later meeting when all the members will be present.

Prices of coal were advanced for the month of September as follows:—Wilkes-Barre, Lackawanna and Schuylkill coals 5c. per ton advance on all sizes except Egg and Stove, which are increased 10c. per ton. Lehigh coals remain unchanged except Egg which is advanced 5c. and Stove 10c.

Bituminous.

The demand for all kinds of bituminous coals is less than a week ago, and many mines are compelled to curtail their out-put, while others have stopped work entirely. During the past few weeks there were quite a number of cargoes of bituminous coal on the market under demurrage, and many of them were sold at very low figures; but they appear to have been worked off, and the experience of those who were thus caught will probably prevent a similar occurrence again; hence there is more regularity in prices although they are low. The indications are not so good for Fall trade as they were a few weeks ago. The Cumberland out-put, last week, was about 3000 tons greater than the previous week, and about 10,000 tons less than for the corresponding week of 1874. The total falling off since January 1st, as compared with the corresponding period of 1874, is 73,411 tons. Shipments from the other regions are fairly maintained, and in excess of shipments to this date in 1874.

Foreign and Gas Coals.—There is no new business doing in these coals. The total shipments of Kanawha coal from Richmond for the first six months of this year were 21,048 tons, of which the Cnanelton Company shipped 10,885 tons, Peytona 5,471 tons, Coal Valley, 4,052 tons, and Blacksburg 640 tons. The unfilled contracts of the Cannelton Company will bring their shipments from Richmond for 1875 quite up to 30,000 tons.

Freights.—Vessels are very scarce here, although freights are no higher. At Philadelphia they are in fair supply, with rates unchanged. At Georgetown and Baltimore they are in good supply, with a downward inclination to freights, although they are nominally unchanged.

Philadelphia Coal Trade.

PHILADELPHIA, Aug. 19, 1875.

There is no change to report in the condition of the trade. The different committees to fix prices meet tomorrow, and an advance to all points is expected, which will give a little more life to the trade for the balance of the month. Small vessels are scarce; large ones are taken up at rates varying from $1 60@$1 40 to Boston. The last rates give a decided advantage to this port over New York for Eastern shipments. The advance of 20c. per ton (10 per cent. off instead of 20 per cent.) freight on lump and steamboat sizes to Port Richmond, is intended to have been aimed at parties who bid for contracts with the Government below the Company's rates, and is a fair instance of the power possessed by it and of the readiness to use it.

Wholesale Prices of Anthracite Coal for August f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
*Lackawanna and Scranton at Rondout and Hoboken	5 00	5 10	5 20	5 45	5 90	4 90
‡Pittston at Newburgh	5 05	5 05	5 15	5 30	5 80	4 85
Wilkesbarre at Port Johnston	5 00	5 10	5 20	5 45	5 90	4 90
Plymouth, R. A., *Net*	....	....	....	5 45	5 90	4 90
Susque. Coal Co. at Amboy W.A.	....	....	....	..	....	....
Kingston at Hoboken	....	....	..	....	....	....
Lehigh Coals.						
Old Company at Port Johnston	5 55	....	5 45	5 55	5 90	5 10
Old Company's Room Run "	....	....	....	....	....	....
§Sugar Loaf, Hobok. &Amb."	5 55	....	5 45	5 55	5 90	5 10
Lehigh Coal Exchange "	5 55	....	5 45	5 55	5 90	5 10
Honey Brook Lehigh	5 55	....	5 45	5 55	5 90	5 10
Spring Mt. C. Co. at Hoboken	....	....	....	....	....	....
Beaver Meadow at South Amboy	5 55	....	5 45	5 55	5 90	5 10
†**Schuylkill Coals at Port Richmond.**						
Schuylkill white ash	4 50	4 60	4 70	4 95	5 40	4 40
Schuylkill red ash	..	....	5 00	5 05	5 45	4 40
Shamokin white and red ash	....	....	....	5 15	5 55	4 45
Lorberry	....	....	5 70	5 70	5 70	4 60
Lykens Valley	....	....	6 30	6 30	6 30	5 45

Per ton.

Freight from Hoboken and Weehawken to New York.... 40c.
" " Elizabethport & Port Johnston to N. York. 45c.
" " South Amboy to New York.... 50c.

*Freight on Lackawanna coal from Rondout to New York, by boats or barges of the D. and H. Canal Co. 50c. per ton. The expense of towing vessels from New York harbor to Rondout and back will be borne by this Company.

† Freight from Port Richmond to New York (free of discharging) 85c. per ton.

‡ Prices to the Trade.

§ By Canal at New York, Jersey City and Brooklyn, 30c. additional alongside.

Schuylkill coal is delivered f.o.b. of boats in New York harbor at 5cc. per ton additional to these rates.

Pittston coal is delivered to carts in New York or Brooklyn at 65 cents per ton in addition to the above rates.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$5 20	$6 50
" " at S. Amboy	6 00	6 50
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	..
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	5 00	6 50
Despard, West Va.,	——	6 50
Murphy Run, West Va., at Baltimore	4 75	6 50
Fairmount, West Va., " "	4 75	6 50
Newburgh Orrel, Md. " "	4 75	6 50
Cannelton Cannel, W. Va., at Richmond.	9 50	11 00
" Splint, " "	5 00	6 50
Peytona Cannel, " "	9 50	11 50
Straitsville " at Sandusky, O	3 25	10 00

Foreign Gas Coals.

	Sterling.	Am. cur'cy,
Newcastle, at Newcastle-on-Tyne	10/6@12/9	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	47/	18 00@20 00
" Gas Cannel "	30/	12 00
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S	2 00	5 50
Caledonia, at Port Caledonia	1 75	5 25
Glace Bay, at Glace Bay	1 80	5 50
Lingan, at Lingan Bay	75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Steam and House Coals.

Broad Top, at the mine, $1 25; at Amboy	4 75@5 00	5 25@5 50
Cumberland, at Georgetown and Alexandria, Va	4 00@4 25	....@....
Cumberland, at Baltimore	4 15@4 50	5 75@6 25
Clearfield and Allegheny, "Derby," "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, $1 25; at Greenwich, Phil.	4 60	5 65

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$6 20	$6 40	$5 60
*Lackawanna coal, delivered	6 75	7 00	6 25
Wilkes-Barre, "	7 00	7 25	6 75
Lehigh & Locust Mountain, del'd	7 00	7 50	6 50
Schuylkill Red Ash, del'd	7 00	7 50	

The Cost of delivering Pittston coal ranges from 40 cts. to $1 per ton, according to distance from the yard.

* Lackawanna grate is quoted 25c. per ton less than egg.

Williamsburgh, N. Y.

Lackawanna Coal at Yard.

Stove	$6 40
Egg	5 90
Chestnut	5 40

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$23 00
Liverpool House Cannel " " "	25 00
American " " " "	16 00
American Orrel " " "	11 00
Red Bank Cannel " " "	14 00
Cumberland " " "	7 00

Prices of Scranton, Pittston, Plymouth, Shamokin and Lackawanna Coal, for the Month of August, at various points.

PER TON of 2000 lb.

	Delivered at Elmira.	Watkins.	Ithaca.	* Syracuse.	† Oswego.	† Rochester.	‡ Buffalo.
	Afloat	Afloat	Afloat	Afloat	F.O.B	Afloat	Afloat
Grate	4 45	4 75	4 75	4 90	5 85	5 60	5 85
Egg	4 45	4 75	4 75	4 90	5 85	5 60	5 85
Stove	4 85	5 20	5 20	5 35	6 30	6 05	6 30
Nut	4 6.	4 65	4 95	5 10	6 05	5 80	6 05

† Coal is delivered to retail consumers at these points for $1 25 per ton additional to these rates.

* At this point 75c. per ton additional is charged to retail consumers.

‡ At this point 50c. per ton additional is charged to retail consumers.

Baltimore, Md. Aug. 16, 1875.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 80	$4 65
Broken	5 46	5 31
Egg	5 77	5 62
Stove	6 02	5 87
Nut	4 90	4 87
Shamokin, (red or white ash), and "Boston," freeburning white ash,		
Egg	5 80	5 62
Stove	6 00	5 87
Lykens Valley, red ash,		
All sizes	6 30	9 12

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2240 lb. $7 00@8 00.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point	4 35	4 65
West Virginia f. o. b. at Locust Point		5 50
Youghiogheny Gas, f. o. b. at Locust Point		5 50
Swanton Coal, George's Creek		4 40

Boston. Aug. 16, 1875.

Reported by our Special Correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 20	Westmoreland and Penn.	6 85
Caledonia	5 00	Waverly Co. Youghiogh'y.	6 80
Pictou	5 60	Cannelton Cannel	11 60
Block House	5 20	Cumberland	5 80@ 6 00
Red Bank Cannel	10 00	Anthracite	.6 50@ 7 25
Glace Bay	5 00	" retail	.7 50@ 8 00
Sydney	6 25		

There is no change to notice in foreign. Ince Hall Cannel continues to be taken in small lots at $24 per ton; and for Scotch and American Cannel prices are quite steady. Nova Scotia coal continues very quiet. No sales to report. The few cargoes received were previously disposed of. Gas coals continue to arrive quite freely on contract. In Cumberland no change and sales limited. Freights continue low, and coal's of all kinds are now as cheap as they are likely to be this season. The retail sales of anthracite have been at $7 75@8 25 per ton, and cargo prices are nominally $6 50@7 per ton.—*Shipping List.*

Buffalo, N. Y. Aug. 16, 1875.

Reported by our Special Correspondent.

Prices free on board vessels here are as follows:

ANTHRACITE.

	Afloat.	F. O. B. Vessel.	Retail. Deliv'd.
Grate	$5 85	$6 35	$7 00
Egg	5 85	6 35	7 00
Stove	6 30	6 80	7 45
Nut	6 05	6 55	7 20

	Lump.	Run of Mine.	Nut.	Slack.	Nut & Slack.
Connellsville Coke	$5 50	....	....	....	....
Brookfield Coal	....	....	....	....	....
Briar Hill	4 50	....	....	....	3 00
Youghiogheny	4 75	....	....	....	....
Monterey	3 75	3 50	3 25	2 50	....
Catfish	3 75	3 50	3 25	2 50	....
Stoneboro	....	....	3 25	2 50	....
Sterling Cannel	5 50	....	....	....	....
Buffalo Coal Co	3 50	3 25	....	2 30	....

Chicago, Ill. Aug. 16, 1875.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

Retail prices per ton of 2000 lb. delivered to buyer.

No change in prices of coal.

BITUMINOUS.

Lehigh Lump	$10 00	Briar Hill and Erie	@ 7 00
Lehigh grate and egg	10 00	Walnut Hill, Pa	@ 6 00
Lehigh stove and chest	10 50	Midway, Pa	@ 6 00
Lackawanna, Wilkes-Barre and Pittston*		Cannel	@ 9 00
		Blossburg	8 00
Grate and egg	9 00	Indiana Block	5 50
Stove and chestnut	9 50	Hocking "Brooks"	6 00
		Wilmington and Illinois.	4 50

* 50 cents off these prices for car load lots to country dealers and manufacturers.

Cincinnati, O. Aug. 16, 1875.

Reported by our Special Correspondent.

No change in prices of coal.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½c.	——
Pomeroy coal	6c.	——
Cannel coal, according to quality	12½@16c.	——
Semi Cannel	7½c.	——
The following are the retail prices delivered:		
Youghiogheny	— c.	$3 25
Pomeroy	— c.	2 75
Cannel	— c.	5 50
Kanawha Semi Cannel	— c.	3 25
Anthracite	9 50@10	——
Foundry coke	—	——
Coke, hard and soft	10 c.	——

Cleveland, O. Aug. 16, 1875.

The *Manufacturing and Trade Review* says: "The coal market remains without change as regards prices. The difficulties in the Tuscarawas Valley have thus far produced no changes to note in the local trade.

"Should they continue beyond the present week the condition of the market will be changed with respect to the kinds offered, but no marked deviation in prices is anticipated.

"Quotations are unchanged throughout the list."

"We follow our last week's quotations, as furnished by WARNER, BATES & CO.:

WHOLESALE.

Per ton of 2000 lb. f. o. b. vessels.

	For vessels,	On cars.
Youghiogheny Gas Coal	$4 40	$4 15
Cannell	4 50	4 15
Blossburgh	5 00	5 00
Briar Hill Block Coal	3 80	3 60
Hocking Valley	3 25	3 10
Straitsville Coal Co., lower vein	3 25	3 10
Mineral Ridge	3 10	3 25
Massillon	3 10	3 30
Tuscarawas Valley	2 85	2 70
Columbiana	2 80	2 60

RETAIL DELIVERED.

	Lump.	Nut.
Briar Hill	$5 00	$3 50
Massillon	4 50	4 00
Mineral Ridge	4 50	4 00
Columbiana	3 25	3 00
Stillwater	3 25	3 00
Tuscarawas Valley	3 25	3 00

ANTHRACITE DELIVERED.

	Grate.	Egg.	Stove.	Chestnut.
Lehigh	$9 00	$9 00	$9 50	$9 25
Wilkes-Barre	7 75	7 75	8 25	8 00
Lackawanna	7 75	7 75	8 25	8 00

Detroit, Mich. Aug. 16, 1875.

Specially reported by Messrs. ROBINSON & KEYS, Dealers in all kinds of coal.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep.sizes.	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	9 00	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 50	Erie	7 50
		Massillon	7 00

Erie, Pa. Aug. 16, 1875.

Reported by our Special Correspondent.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. Aug. 16, 1875.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers.

Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

Indian Creek, per ton	$2 75	Peytona cannel, per ton	7 00
White River, "	2 75	Indiana Cannel	6 50
Brazil Block, "	2 65	Hocking Valley	4 25
Highland, grate, "	2 25	Youghiogheny	4 75
Block coal, nut, per car	18 00	Blossburg (smithing)	6 50
Highland " "	18 00	Piedmont "	6 50
Block Slack "	17 00	Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$9 95	Nut	9 80
Egg	9 95	Stove	10 25

Owing to the Miner's strike there is no Lehigh coal in this market.

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	14	" Slack, "	7
Brazil Block	14	Peytona Cannel	28
Highland grate	14	Indiana "	24
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, " "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE,

Wilkes-Barre and Lackawanna (all sizes)	$10 per ton.
Lehigh, retail	$11 50 per ton,

Louisville, Ky. Aug. 16, 1875.

Specially reported by Messrs. BYRNE & SPEED.

WHOLESALE.

	per bushel		per bushel
Pittsburgh	8c	Pine Hill	9c.
Raymond City	9c.	Kentucky	9c.

RETAIL.

	per bushel		per bushel
Pittsburgh	14c.	Peytona Cannel	22c.
Raymond City	12c.	Buckeye "	20c.
P ne Hill	12c.	City-made Coke	1cc.
Kentucky	11c.	Anth., per ton,	$10 00 to 10 50
Screened Pittsburgh per load			$3 00
Screened Raymond City			2 75
Pine Hill (Kentucky)			2 75
Cannel			$5 to 5 50

Milwaukee, Wis. Aug. 16, 1875.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Scranton	9 50
Lehigh Prepared	10 50	Briar Hill, select	8 00
Lackawanna	9 50	Blossburgh	8 00
Pittston	9 50	Pittsburgh	7 00

New Orleans, La. Aug. 14, 1875.

Pittsburgh coal, retail, per bbl	6cc.
" wholesale	35c.
" steamboats, per box	5cc.
" to manufacturers, per bbl	55c.
" shipments, per hhd	$6 00
Anthracite, wholesale, per ton	none.
" retail, "	...
Virginia Cannel, per bbl	9cc.
Scotch " "	....
St. Bernard, wholesale, per bbl	37½c.
" retail, "	60c.

Pittsburgh, Pa. Aug. 18, 1875.

By our Special Correspondent.

Per ton of 2000 lb. and Bushel of 76 lb.

Youghiogheny coal, ton,	$2 00	Pittsburgh retail deliv'd.	
" coke, "	2 50	per bushel	9@10cc.
Connellsville coal, "	2 50	Anth'cite on cars Lehigh	$7 75
" coke	$2 25@2 75	" " Wilkes-Barre	6 75
Pittsburgh coal	1 85		

Twenty-five to fifty cents per ton additional for delivery.

COAL.—There has been no movement by river since the date of our last review, as navigation continues suspended, and even if there was water, there is but little coal here to go, as it was pretty well cleared up on the last rise. Furthermore, there is no inducement in the present overstocked and depressed condition of the markets below to make shipments, even if there was water, and a good deal of the coal which was shipped out recently still remains in first hands below, the owners thereof either being unable to sell, or unwilling to accept current rates. Our latest advices from Cincinnati and Louisville quote at 7½@8c. afloat, which, it is said, will not much more than cover actual cost. A circular from New Orleans, under date of August 1st, reports the stock there in first hands at 55 boats and 3 barges, with a consumption of but 10 boats during July.

COKE.—There is not ing new or important to record that we are aware of; business, while it is not all that could be desired by any means, is about all that could be expected, and no very decided improvement can be looked for until there is a revival in the pig iron trade, as the consumption is comparatively light, in consequence of so many pig iron furnaces being out of blast. Furthermore, as there is no probability of any very decided improvement in pig iron before the fall or winter, we do not look for any material increase in the consumption of coke for several months to come, and until there has been, business must of necessity continue dull. Prices nominally unchanged; $2 65@$2 75 delivered free on cars in Pittsburgh.—*American Manufacturer.*

Richmond, Va. Aug. 17, 1875.

Specially reported by S. H. HAWES, Dealer in Coal.

Only alteration in my report is on New River Bituminous.

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$12 00	New River Bituminous	$4 65
" semi-Cannel	4 75	Clover Hill Coal	4 25
Coalburgh Splint	4 90	James River Bitum	3 30
Lewiston "	4 90	" " Carbonite	5 80
Kanawha Gas coal	4 50		

San Francisco.

From the *Commercial Herald*, Aug. 5, 1875.

Imports from January 1st to July 27:

Anthracite tons	7,027	English, tons	26,537
Australian, tons	67,533	Vancouver Island, tons	34,567
Coos Bay, tons	20,721	Rocky Mountain, tons	42
Cumberland, tons	6,703	Seattle, tons	28,670
Mt. Diablo, tons (6 mos)	75,700	Bellingham Bay, tons	6,170

Supplies of all descriptions have of late been very considerable, with the exception of anthracite, which is yet scarce and high. Cumberland also seems to be in buyers' favor. Australian and English Steam cannot be quoted at over $8 75@$9 for large cargoes to arrive. Every sale recently made, here or to arrive, has been upon terms withheld—all paying a loss to the importer according to the rate of freight charged. Recent imports include 700 tons from Nanaimo per *Prince of Wales*; 500 tons Bellingham Bay per *Amethyst*; 911 tons Seattle per *Amethyst*; 1,800 tons Australian per *Coima* from Newcastle, N. S. W. We quote Bellingham Bay at $8 50; Coos Bay, $10; California Mt. Diablo steam, $8 50@$8 25 for fine and coarse respectively. Cumberland, $18@20; Nanaimo, $9 50@10; Seattle, $9 25@10. The *Janet Cowan*, from Newcastle, N. S. W., has 1,810 tons.

Toledo, Ohio. August 16, 1875.

Specially reported by Messrs. GOSLINE & BARBOUR.

Per ton of 2000 lb. on cars.

Hocking Valley	$3 40	Massilon	4 20
Straitsville	3 40	Youghiogheny	5 00
Shawnee	3 40	Blossburg	7 00@7 50
" nut	2 90	Cumberland	7 00@7 50
Briar Hill	5 50	Connellsville coke	7 00

ANTHRACITE.

Grate, screened	$7 75	Stove, screened	$8 25
Egg, "	7 75	Chestnut "	7 75
Lehigh Lump	9 50		

40 cents to $1 per ton additional for delivery at retail.

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals.

per ton of 2240 lb.

PORTS.	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.‡
To ‡ Newark, N. J., via Central Railroad of New Jersey	2 56	2 42	2 86	2 89	3 12
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	48	69
‡ Philipsburg, N. J.	97	83	1 34	1 30	1 65
‡ Elizabethp't, Port Johnston, Hoboken and South Amboy, N. J., shipping and wharfage 35c. add.	2 20	2 06	2 80	2 53	2 76
High Bridge, N. J.	2 40	2 20	2 80	2 79	3 09
Somerville and Raritan, N. J	2 80	2 60	3 20	3 19	3 49
Elizabeth, Cranford, Westfield & Elizabethport, for consumption,	2 62	2 42	3 35	3 01	3 19
¶ Jersey City, N. J., and New York, via Morris Canal	2 85	2 34	3 17	3 24	3 54
Andover, via Delaware, Lackawanna and Western RR	3 30	3 10	3 70	3 69	3 99
§ Trenton, Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	3 34
Trenton, for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

From Mauch Chunk to New York (towing limits) and Jersey City† via Lehigh Valley RR. and Morris Canal.... $2 36

From *Lackawanna Junction* to *Auburn, N. Y.*, for shipment, via Southern Central R R. in connection with Pa. and N. Y. R.R. 2 59

From *Lackawanna Junction* to ‖*Weedsport* for *Rochester and Charlotte*..... 2 41

From *Lackawanna Junction* to *Sterling* for *Oswego, N.Y.*.. 2 58

* To this point for Syracuse the rate is 2 06

‖ To this point for all places between Rochester and Buffalo the rate is 2 59

* The rate to this point for Syracuse is..... 2 22

**Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

¶ 20 cents per ton additional for transferring coal from boat to boat, and 30 cents per ton for reshipment of same from wharves.

† Transportation on Coal destined for re shipment from this point is 20c. less than above rate.

We are in receipt of the followinw from the Lehigh Valley R. R. Company:

Notice to Shippers.

List of Stations on, and reached by, New Jersey Division of L. V. R. R. Mark Manifests and Envelopes via L. V. R. R.

Kennedy,	Perth Amboy,	Millstone and New Brunswick Railroad,
Musconetcong,	East Millstone,	
Bloomsbury,	Middlebush,	
West End,	Clyde,	
Pattenburg,	Voorhees,	
Midvale, (Clinton,)	New Brunswick,	Pennsylvania R. R.,
Landsdown,	Stelton,	
Stanton,	Woodbridge,	
Three Bridges,	Uniontown,	
Neshanic,	Rahway,	
Flagtown,	Linden,	
South Somerville,	Elizabeth,	
Bound Brook,	Waverly,	
New Market,	Newark,	
New Brooklyn,	Meadows.	
Metuchen,	Jersey City,	
Fords,	New York.	

Erie Canal.

	Per 2240 lb.
Hoboken to Buffalo	75c.
" Rochester	70c.
" Oswego	65c.

The above rates are exclusive of harbor towing, trimming unloading and tolls.

Break in the Erie Canal.

ALBANY, N. Y., August 19.

Information has been received here of a bad break in the Erie Canal, on the four-mile level, above Van Slyck's aqueduct. Twenty feet of the culvert and one hundred feet of the tow-path, twenty-five feet deep, were washed out. A light boat is lodged in the break. It will take four or five days to repair the damage.

Delaware and Raritan Canal.

Tolls and Steam Towage.

Per 2240 lb. Cargoes to exceed 110 tons.

From Fairmount to New York, towing limits within 53d st.	74c.		
" Greenwich "	64c.	Bituminous	64c.
" " "	69c.	Anthracite	69c.
" Lambertville "	6.c.	Anthracite	6.c.
" Port Richmond "	68c.		
" " "	63c.	Semi-bituminous coal,	63c.
" Philadelphia "	57c.	Cumberland "	57c.
" Trenton "	37c.	Anthracite "	37c.

CANAL TOLLS, exclusive of towage, Bordentown to New Brunswick, when towed by the Company's Steam Tugs:

For Anthracite Coal ..... 35c.

Bituminous and Semi-bituminous Coal... 35c.

Freights.

Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore and Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	2 00	....
Albany	*85	1 70	....
Amesbury, Mass	....	....	....
Bangor, Me	†1 35	1 90	1 25
Bath, Me	1 60	1 65@1 80	1 30
Baltimore	....	....	....
Boston, Mass	1 60 & 3c.	1 75	1 25
Bridgeport, Ct	*85	1 50	80
Bristol, R. I.	....	....	90
Cambridgeport, Mass	§1 60	....	1 25
Derby	....	1 60	....
Dighton	....	1 60	§1 25
East Cambridge	1 60&3c.	....	....
Fall River	1 35	1 50	90
Hackensack	....	....	....
Hallowell, Me	....	....	....
Hartford	....	....	1 25
Hoboken	†85	1 30	40
Hudson	1 00	1 60	....
Jersey City	....	1 30	40
Lynn, Mass	‖1 60	....	†1 25
Middletown	....	....	1 10
Mystic	....	....	....
Newark	....	....	....
New Bedford	1 30	1 50	90
Newburyport	....	1 90	1 35
New Haven	*85	1 50	90
New London	1 35	1 50	85
Newport	1 35	1 50	90
New York	85†	‖1 40	40
Norfolk, Va	75	60	....
Norwalk	....	1 65	90
Norwich	....	1 65	90
Pawtucket	1 40‡	1 75	‡100
Philadelphia	....	80@1 00	....
Portland	1 50	1 65@1 75	1 20
Portsmouth, N. H.	1 60	1 85	1 40
Providence	1 35	1 50	90
Petersburg, Va	....	90	....
Portsmouth, Va	....	....	....
Poughkeepsie, N. Y.	....	1 50	....
Richmond, Va.	85	80	....
Rockport.	....	....	....
Saco	....	....	....
Sag Harbor	....	....	1 00
Salem, Mass	1 60	1 75	1 25
Salisbury Pt., Mass	....	....	1 50
Savannah, Ga	....	1 50	....
Stamford	*85	....	85
Stonington	....	....	....
Taunton	.. .	...	1 30
Trenton, N. J.	....	....	....
Troy	....	....	....
Warren, R. I.	....	....	90
Washington, D. C.	80	....	....
Wareham	....	1 65	....
Weymouth	....	1 80	....
Wilmington, Del.	....	85	....
Wilmington, N. C.	....	1 50	....

* And discharging and towing. ‡ And towing.

† And discharging.

§ 3c. per bridge extra.

‖ The rate to this point by barge is $1 65.

¶ To wharf.

THE BRITISH COAL AND IRON TRADES.

LONDON, Aug. 7, 1875.

THE IRON TRADE.

There is but little change to note in prices or the condition of trade. The stocks of pig iron are large and prices are generally in favor of buyers. There is a general inclination to blow out furnaces rather than accept lower prices. The North of England market has been partially sustained by foreign shipments. But little business is doing in Bessemer irons, and that at less than the nominal rates; it is stated, however, that there are enough orders in hand to keep the furnaces going for two or three months. In manufactured iron a better feeling exists in the South Staffordshire district; an improved demand having sprung up for sheets and hoops. The North of England rail mills are very quiet, and many will have to close unless an improved demand sets in. There is no improvement in South Wales, although hopes are expressed that they may secure a portion of a large Russian order which it is expected will be placed soon.

The following are the leading quotations of iron:

	Tees, f.o.b.	Barrow, f.o.b.	Liverpool, on trucks.
No. 1 Pig	55/	*80/	70/6
No. 2 "	52/6	*77/6	....
No. 3 "	48/@49/	*75/	68/
No. 4 Forge.	47/	75/	65/
Common Bars.	155/@160/		....
Rails	140/@147/6		142/6

* Bessemer Pig.

Common bars in South Staffordshire, £8, and marked bars £10–12/6 extra for Lord Dudley's. Rails in Wales £6 15/.

THE COAL TRADE.

The supply continues largely in excess of requirements, although many of the pits are only working partial time. In the North of England, a good demand continues for gas and house coals, while all other descriptions are very dull. The shipments from Hull, Grimsby and Goole during the week were about 2,500 tons less than during the corresponding week of 1874, although greatly in excess of those in 1873. In the South Wales district there is a fair demand for steam coal, but the output being much larger than the requirements, prices are low. Tyne coals are quoted f. o. b as follows: 11/@15/ for house; 12/@16/ for steam; 8/ 6d@10/ for nut; and 8/@10/ for gas coals. Hetton f. o b. Sunderland, 10/ 6d.; common steam coal at Liverpool 8/ 6d., and good Lancashire 10/ per ton. Steam coal, at Rhymney, 10/9d.@12/6d.; house, 10/6d.@12/; and small 5/ per ton.

THE LABOR MARKET.

The South Yorkshire and North Derbyshire Coalowners' Association have agreed to reduce miners' wages, and negotiations are going on with the Miners' Association.

An agreement has been entered into between the ironworkers and ironmasters of South Staffordshire, to the effect that puddlers' wages shall be 9/ per ton and other wages in proportion, the agreement to go into effect August 23, and to continue until January 1st, 1876. This agreement also provides for extras and privileges similar to those given the ironworkers of the North of England.

The North Wales colliery owners have resolved to reduce miners' wages 15 per cent., to take effect on the 28th, inst. The masters will refer the matter to arbitration if it is considered necessary.

At a late meeting of the Executive Council of the Amalgamated Miners' Association, it was agreed "that a special conference be convened on the 24th of August, at Shrewsbury, to consider and determine what course is best to take in regard to the new National Union, and the existence of this Amalgamated Association."

ECONOMY IN THE USE OF FUEL.

Mr. WM. ROGERS, of the firm of Messrs. ROGERS, BURCHFIELD & Co., of Leechburgh, Pennsylvania, who lately arrived in this country is making experiments of injecting blast at the top of heating furnaces upon the principle of the blow-pipe, and is meeting with considerable success. If all should be realized which is anticipated it will be possible to make finished iron of cheap slack, instead of costly large coal, and the residuum of the coal so burnt will be a serviceable coke.

FURNACES IN BLAST IN SOUTH STAFFORDSHIRE.

The number of furnaces in blast in the South Staffordshire district is 76, the aggregate weekly yield of pig iron is 7,000 to 8,000 tons; and the consumption about 12,000 tons.

SCOTLAND.

THE IRON MARKET.

Warrants have ranged from 60 to 62/ 6d. Business is very dull. Prices are weak, and concessions of 2/ have been made for the end of the year. The number of furnaces in blast is 116, as compared with 89 a year ago. There is an inclination to blow out more furnaces. The stock of iron in CONNAL & Co's. stores is 36,091 tons, as compared with 24,469 tons a year ago, and 35,671 tons December 25, 1874. The shipments of pig iron for the week were 475 tons less than for the corresponding week of 1874, and the total shipments since December 25, 1874, are 78,930 tons greater than for the corresponding period of 1873-4. The total imports of Middlesbrough pig iron into Grangemouth show an increase of 15,000 tons this year over 1874. The following are some of the leading quotations of No. 1 iron f. o. b, at shipping ports. Gartsherrie, 69/; Coltness, 69/; Summerlee, 66/; Langloan, 69/; Glengarnock. 66/ 6d., and Eglinton, 61/. The malleable trade is very quiet and prices have been accepted under regular rates. The exports of manufac

tured iron are much smaller than usual. Freights to New York are 5/; to Boston, 12/ 6d.@14/; to Philadelphia, 12@14/; and to Baltimore 12@15/.

THE COAL TRADE.

There is an improved demand for household coals, which are firmer in prices; but trade in other respects continues dull. Steam and shipping coals are in but light request. There are no indications at present, that a further reduction will be made in miners' wages.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, August 20, 1875.

American Pig.—The condition of the market is very similar to what it has been for weeks. We are reported sales of 2500 tons of No. 2 X on private terms, and about 2900 tons in lots, part on private terms, and the balance at figures on the basis of $26@$27. The leading matter for the attention of the iron trade is a proposition recently made by the Reading Railroad Company to furnish about forty idle furnaces in the Schuylkill Valley with coal, ore and limestone, and to take the product off their hands. If a large number of these furnaces should accept this proposition, and the Railroad Company should place the whole or the greater portion of the products upon the market, we may look for much lower prices, for the company will be able to net a profit on prices below those now being realized. If other Transportation Companies do not offer inducements sufficient to permit other furnaces to compete with the Reading Company, the stacks on such lines will have to blow out, and if they do give such inducements, we are likely to have an abundance of cheap iron which will of necessity have to find a foreign outlet or our troubles will grow greater and not less. We hope to have sufficient information on this subject to give it fuller attention in our next. We quote No. 1 foundry $26@27; No. 2 foundry $24@25; and forge $22@24. The general market quotation, however, is on the basis of $26 for No. 1 foundry, which is an outside figure on plenty of good irons, although parties who want a special brand are in many cases compelled to pay an advance.

Scotch Pig.—We are reported sales of 200 tons of Coltness and 200 tons Eglington on private terms. Holders appear more firm in their prices—Glasgow prices having advanced and freights being quoted at 7/ 6d. or an advance of 5/ as compared with same rates secured during the past four weeks. We quote Eglington $29 50 @30; Coltness and Gartsherrie $32.

Rails.—We are reported a sale of 1000 tons of iron by a Pennsylvania mill on private terms. We quote at $47 @50 for iron at mills and $75 for steel. The inquiries are not so flattering as they were a few weeks ago.

Old Rails.—We note a sale of 600 tons on private terms and quote at $26, with but little inquiry.

Scrap.—We are reported sales of 200 tons and 500 tons at rates said to be from $30 50@31 50. We quote at $30 @32.

Baltimore. Aug. 18, 1875.

Specially reported by Messrs. R. C. HOFFMAN & Co.

Our pig iron market continues dull, and buyers are only purchasing what is required to fill orders in hand, preferring to trust to future events rather than lay in a stock at present low prices. While the stock of charcoal irons are gradually decreasing, they are still ample for the limited demand.

We quote prices as follows:

Baltimore Charcoal	$30@35	Anthracite No. 2	$24@26
Virginia Charcoal	29@35	" No. 1	23@24
Anthracite No. 1	26@27	Mottled and White	20@22

Boston. Aug. 18, 1875

IRON.—There are no new features to report. Trade is quite dull, with no signs of any improvement this month. Scotch Pig is without sales of importance and prices nominal American Pig is selling in a small way at $27@31 per ton, as to quality, with a weak tendency. Refined Bar is steady at $58@$59 per ton, with a light trade Common Bar is quiet at $53@54 per ton. Rails are without movement of importance. Sheet iron is in limited request at previous prices.

Imports of Pig Iron from Jan. 1 to August 14

	1874.	1875.
From Great Britain, tons	2 475	1,350
Coastwise	7,028	8,897

LEAD.—Market quiet, with no movement to report. We quote domestic at 6c., and foreign nominally 6¾@7c. per lb. gold. The New York *Shipping List* says that soft Missouri, for corrosion, is quoted 6½c. currency, at St. Louis, and a further advance of one-quarter of a cent is looked for shortly, the stock of this kind being inadequate to the demand for White Lead purposes, while there are very little, if any, fine brands coming from Europe. Latest European advices report firmer markets, and an early advance looked for on account of scarcity of stoks.

Imports from January 1 to August 14.

	1874.	1875.
Pigs	66,878	22,054

TIN.—Pig is firmly held at 18½@19c. gold, with sales confined to small lots. Demand light.

TIN PLATES.—The market is quiet at previous prices. We quote currency rates as follows: Charcoal I.C. at $10@10 25; Coke at $7 75@8 50; and Terne, including all kinds, at $7 75@10 75 per box.

COPPER.—No change to report in prices of manufactured copper. We quote Sheathing at 30c.; Bolts and Braziers at 31c.; and Yellow Metal Sheathing at 22c per lb. Ingot is held at steady prices, with sales at 23@23½c. per lb.—*Shipping List.*

Cincinnati. Aug. 17, 1875.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Our market for pig iron remains inanimate and quotations are unchanged, viz.:

CHARCOAL.			
Hanging Rock, No. 1 Foundry	$27 00@	....—4 mos	
" No 2, "	25 00@26 00	—4 mos	
" Mill	24 00@25 00	—4 mos	
Tennessee No. 1, Foundry	26 00@26 50	—4 mos	
Tennessee, No. 2, "	24 00@25 00	—4 mos	
" Mill	24 00@25 00	—4 mos	
Missouri, No. 1, Foundry	@	....—4 mos	
STONE COAL.			
Ohio, No. 1, Foundry	24 00@25 00	—4 mos	
" No. 2, "	23 00@24 00	—4 mos	
Ohio Mill	23 00@24 00	—4 mos	
Missiouri, No. 1 Foundry	27 00@28 00	—4 mos	
" No. 2, "	26 00@27 00	—4 mos	
" Mill	26 00@27 00	—4 mos	
CAR-WHEELS.			
Hanging Rock, C. B	40 00@50 00	—4 mos	
Tennessee "	30 00@40 00	—4 mos	
Missouri "	35 00@40 00	—4 mos	
Alabama "	30 00@40 00	—4 mos	
BLOOMS.			
Charcoal	70 00@ 85 00	—cash	
SCRAP IRON.			
Cast	60c.@ 85	—cash	
Wrought	1 00@1 30	—cash	

Cleveland, Ohio, Aug. 16, 1875.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore:

FOUNDRY IRON.	
No. 1, Lake Superior Charcoal	31 50@....
No. 2, " "	30 50@....
No. 1. Anthracite	29 50@....
No 2, "	27 50@....
No. 1, Bituminous foundry	28 50@....
No. 2, " "	27 00@....
American Scotch, No. 1, Cherry Valley	31 00@....
" " B—1, " "	28 50@....
" " No. 2, " "	27 50@....
No. 1, Massilon	30 50@....
B—1, "	27 50@....
No. 2, "	25 50@....
CAR WHEEL AND MALLEABLE IRON.	
No. 3 Lake Superior Charcoal	30 50@....
No. 4 " " "	32 00@....
Nos. 5 and 6 " "	33 00@....
BESSEMER IRON.	
Nos. 1 and 2 Lake Superior Charcoal	31 00@....
FORGE IRON.	
No. 1, Gray	24 50@....
White and Mottled	23 00@....

The pig iron market remains without change, nor can we report any indications of an immediate change for the better.—*Manufacturing and Trade Review.*

Louisville. Aug. 16, 1875.

Specially reported by Messrs. GEORGE H. HULL & Co.

There is some inquiry for first class foundry iron but at low figures. For Colds Blast and Mill the demand is very light.

The usual time 4 months is allowed on the quotations below.

HOT BLAST—CHARCOAL.	
No. 1 foundry, from Hanging Rock Ores	$27 00@28 00
No. 2 " " "	25 00@26 00
No. 1, Mill, from " "	23 00@24 00
No. 1, foundry, from Alabama, Georgia and Tennessee ores	25 00@26 00
No. 2, foundry, from Ala., Geor'a and Tenn. ores	24 00@25 00
No. 1, Mill, from " " " " "	23 00@24 00
HOT BLAST—STONE COAL AND COKE.	
No. 1, foundry, from Hanging Rock ores	25 00@26 00
No. 2, " " " " "	24 00@25 00
No. 1, Mill, " " " " "	23 00@24 00
No. 1, foundry, from Ala. Ga. and Tenn. ores	25 00@26 00
No. 2, " " " " "	24 00@25 00
No. 1, Mill, " " " " "	23 00@24 00
No. 1 foundry, from Missouri ores	27 00@28 00
No. 2 foundry, from Missouri ores	26 00@27 00
No. 1 Mill, from Missouri ores	26 00@27 00
COLD BLAST—CHARCOAL.	
Car Wheel from Hanging Rock ores	35 00@40 00
" " Tennessee "	30 00@33 00
" " Alabama and Georgia ores	30 00@35 00
" " Kentucky ores	28 00@35 00

Philadelphia, Aug. 10, 1875.

Weekly report of the Philadelphia Iron Market, furnished by Messrs. JUSTICE COX, Jr. & Co., Iron Merchants, 333 Walnut street.

The iron market the past week shows the same limited demand that has been quotable for some time. The circular of the Reading Railroad Company, distributed among the idle furnaces, (looking to their resumption) does not have the desired effect, as few, if any, furnacemen feel like running their stacks at a loss, and at the same time getting into the hands of the Reading Company. Consumers who think the early resumption of all idle furnaces would have the effect to further reduce prices will be disappointed, as prices now are as low as they can well get. We still hear of furnaces blowing out in the Schuylkill, and of one blowing in on the Lehigh, so that the production does not vary much, but still keeps a little ahead of consumption. No. 2 iron is more plenty than No. 1. Some large sales of No. 2 have been made in the past week at "off" prices. We hear of 3000 tons Crane private terms; 1000 tons Allentown, also private terms; 500 tons No. 2 Chickies, at $25; 200 tons No 2 St. Charles, at $25; and 300 tons Gray Forge Montgomery, at $24.

The demand is steady but limited to small lots, intended only for immediate use.

In old metals we have no transactions to report. Merchant bars are firmly held by the mills here and near us at 2 6-10 to 2 8-10. Many of the mills have further reduced "wages" and, except in one instance, the men have accepted the "situation."

RAILS.—New American can be bought at from $47 to $50, according to quality and brand. We report sale of 100 tons for Southern use at $49 f. o. b. Steamer here. We quote as follows:

No. 1 Foundry Pig Iron, @ from	$26 to $27
" " " " " " "	24 to 25
" 3 Gray Forge " " " "	23 to 25
Wrought Scrap	28 to 30

Pittsburgh. Aug. 18, 1875.

Specially reported by A. H. CHILDS, Esq., Commission Merchant for the sale of pig iron, blooms, ore, etc.

QUOTATIONS.

No 1. foundry	$27 00@28 00—4 mos
" 2, "	25 00@26 00—4 mos
Gray Forge	24 00@25 00—4 mos
White and mottled	22 00@23 00—4 mos
Hot blast charcoal	28 00@30 00—4 mos
Cold blast charcoal	35 00@40 00—4 mos

The *American Manufacturer* of Aug. 18, 1875, says;

"PIG IRON.—There is nothing new or particularly important to record in regard to this article; business continues exceedingly dull, as it nearly always is during mid-summer, and while the general tone of the market as regards mill irons is steady, prices have undergone no change whatever since the date of our last report. The mills, so far as we can learn, are buying sparingly, only to supply immediate wants, and some of them having been stopped to make repairs and take stock, are buying none at all; however, as the feeling prevails that the market has touched hard pan, and that raw iron is good property at current rates, we should not be surprised at any time to hear of some of the mills contracting for a two or three months' supply, notwithstanding it is claimed there is no margin for profit on the products. Producers of the raw article claim that it can no longer be controlled by the products; that if prices for the latter are down to a point that affords no margin, they must be put up; that the raw article is now selling below actual cost, and with a very light production and a gradual reduction in stock, which is lighter now than it has been for several years, the lowest notch has certainly been reached. Our advices from the Shenango and Mahoning Valleys report that regular shipments are being made from there to Chicago, Cleveland, Detroit, and other points in the West, at better prices than can be obtained here; in other words, about the same rates are being obtained at the furnaces that are ruling here, saving the cost of transportation, which of itself is a good profit. It is not expected that there will be any very decided advance, but producers generally hope to realize $25 4 mos. for good mill irons as soon as the fall trade fairly sets in, and this is not likely to be much longer delayed. Charcoal iron, particularly foundry grades, continue very dull, not only here, but all through the country; the supply is largely in excess of present requirements, and prices are lower than they have been for many years.

"MANUFACTURED IRON.—Trade at present is quiet, as it generally is during mid-summer, but manufacturers are hopeful of the future. In consequencer of the fine weather during the past couple of weeks, giving ample time to complete the harvesting of the crops, the outlook, which for a time was clouded by the protracted rains, has brightened up perceptibly, and an average Fall trade is now confidently expected. While there has been no change in prices, the general tone of the market is firmer, in sympathy with the raw article, and the fact that the feeling is gaining ground, that prices cannot possibly go any lower, but, on the contrary, may advance, will not be without its effect in stimulatiing the market, as it will have a tendency to cause both jobbers and consumers to stock up. We continue to quote on a basis of $2 25@2 30 for merchant bars, westarn classification."

PIG METAL SALES REPORTED FOR THE WEEK ENDING AUG. 18, 1875.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.	
100 tons gray forge (extra)	$25 00—4 mos.
800 tons gray forge	24 00—4 mos.
500 tons gray forge	24 co—5 mos.
250 tons gray forge	23 00—cash
50 tons gray forge close	23 00—4 mos.
100 tons gray forge neutral	23 00—4 mos.
100 tons gray forge white and mottled	22 50—4 mos.
ANTHRACITE.	
200 tons gray forge	$24 00—4 mos.
100 tons gray forge	22 5c—cash.
CHARCOAL.	
30 tons No, 1 foundry, H. R.	$31 00—4 mos.
10 tons No. 1 foundry, H. R.	30 50—cash.
310 tons Nos. 1 and 2 foundry	$27@33—4 mos.
50 tons No. 2 foundry, H. R.	27 00—4 mos.
100 tons No. 2 foundry, H. R.	P. T.
COKE.	
150 tons red bank, gray forge	$25 00—mos.
500 " Allegheny "	24 00—time
200 " Connellsville "	P. T.
BLOOMS.	
300 tons Juniata	$75 00—4 mos.

Richmond, Va. Aug. 18, 1875.

Reported by ASA SNYDER, Esq.

The market for pig iron is as last reported. First-class wheel irons continue scarce and find quick sale. Two

charcoal furnaces have blown out in the past ten days. Not one-fifth of the furnaces in the State are in blast.

Virginia	Cold Blast	Charcoal	Pig Iron	.....	.....	$30	$35
"	Warm "	"	"	"	.....	28	32
"	" "	Coke	"	"	1 X.....	26	27
"	" "	"	"	"	2 X.....	25	26
"	" "	"	"	"	3.....	24	25
"	Anthracite	1 X.....				27	29
"	"	2½X.....				26	27

San Francisco, Cal.

From the *Commercial Herald* of Aug. 5, 1875.

The very heavy arrivals of pig iron in July tendered greatly to depress market rates on spot parcels. While imports have increased the consumption has fallen off. No. 1 Eglinton iron has been sold at $37@38, and Glengarnock No. 1, at $40, with but a light demand. The *Mikado* from Sydney arrived here on the 2d inst., with 232 ingots Australian Tin, worth 22@23c., in light demand. There is a fair demand for tin plate, but at low prices. The Selby Smelting Works have for the present ceased operations, thus lessening the supply of refined lead for exports, etc. It is to be earnestly hoped that the executors of THOS. H. SELBY'S estate will soon be enabled, by sale or otherwise, to resume operations at this valuable, profitable, and important smelting works —in fact the only establishment of the kind upon this coast.

St. Louis. Aug. 18, 1875.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

BITUMINOUS.

Missouri, No. 1	$28@29	Massillon A No. 1	$36@37
" " 2	$26@27	" B " 1	$34@36
" " 1 Mill	$25@26	" " 2	$33@34

CHARCOAL—HOT BLAST.

Missouri, No. 1	$28@29	Hanging Rock, No. 3	$26@00
" " 2	$26@27	Tennessee, No. 1	$28@29
" Mill	$25@26	" " 2	$26@27
Hanging Rock, No. 1	$29@00	" Mill	$25@26
" " 2	$27@00		

CHARCOAL—COLD BLAST.

Missouri Car Wheel	$37@40	Tennessee " "	$35@40
Alabama " "	$35@40	Hanging Rock "	$53@55

MISSOURI BLOOMS AND BILLETS.

Charcoal Blooms	$75@85	Hammered Billets	$90@100
Scrap "	$70@75		

METALS.

NEW YORK, Friday Evening, Aug. 20, 1875.

The wholesale trade continues very quiet, although a fair jobbing business is still doing, with considerable inquiries from all quarters. The London market, as reported by cable to-day, closed very firm, a very large business having been done.

MESSRS. JAMES & SHAKSPEARE, of London, under date of August 6, say: "We have still to report a dull and dragging market, there being an utter absence of speculation, and not the least desire to purchase, except for immediate requirements. On the other hand, importers and dealers evince no anxiety to sell, and if the slightest eagerness be shown to purchase, they at once withdraw their goods, or ask prohibitive rates. Money is both cheap and abundant, and seems likely to continue in this position for some time to come; it is, therefore, probable that it will shortly exercise a certain influence, and cause a revival in trade."

Gold Coin.—During the week past gold has ranged from 113@114¼, and closed at 113¾.

Bullion.—Fine silver bar is quoted at $1 23@$1 24, gold, per ounce, and fine gold bar at par ($20 67, gold, per ounce) to ⅛ per cent. premium. The advance in silver is caused by the Government making purchases.

Copper.—The sales during the week have aggregated about 300,000 lb., at 23c.@23¼c. The asking prices are 23¼@23½. There is but little inquiry, consumers only making hand-to-mouth purchases. The advance is caused by a concentration of stock, it being said that there is but little, if any, copper outside of the Combination, and that many of the small companies are behind in their deliveries. The position is said to be such that copper could be advanced to 25c., were it not that there are fears that it would result in greatly reducing sales.

Chili Bars were quoted by cable, at the close of the London market, at £82 10/, or a slight advance on our quotations last week.

ERNEST W. G. MURRANT, ESQ., of London, under date of August 6, says: "At the Swansea Ticketing on Tuesday last, about 1,300 tons of ore, with an average produce of 17¼ per cent., brought an average price of 15/9¼ per unit. CHILI—The charters for second half of July are announced as 1,400 tons, making a total of 3,500 tons for the month, or a little over the average. The accumulation of stock on speculative account on the West Coast, of which practical proof has recently been given, leads to the impression that further heavy charters may be anticipated. As a consequence, the market has been sluggish during the past month. The price of bars receded about £4 per ton during July. The sales for the month were 1 700 tons of g.o.bs and named brands at £77/10@£82 for cash and forward delivery. Australian and English quiet."

The stocks in England and France, with Chili chartered and afloat for same, on 1st inst., were 30,391 tons, or an increase of 712 tons during the month of July. The stocks at the corresponding date of 1874 and 1873 were 32,915 tons and 39,484 tons respectively. The deliveries during July of 1875, 1874 and 1873 were 4,614, 4,483 and 3,941 tons respectively, and from January 1st to July 31st for the same years 36,629, 38,678 and 32,806 tons respectively.

Tin.—There is much more firmness in pig tin, which is held at 18¾c.@19½c. gold for Straits, Refined, and L. & F. There is no business of note doing in a wholesale way. Straits was quoted by cable, at the close of to-day's London market, firm at £80. A quotation from Singapore a few days ago was 21⅞ per picul. Tin plates were quoted in London to-day as being quite firm. A fair jobbing business is doing in plates in this market at unchanged prices. We quote charcoal tins at $8@$8 25; and ternes, $7 25@$7 50; coke tins, $6 75@$7; and ternes, $6 25@$6 75 prices all gold.

MESSRS ROBERT CROOKS & Co., of Liverpool, under date of August 5, say:—Market for tin plates during the past month has not been at all brisk, and much disappointment is shown at the non-revival of the demand. Prices have consequently again shown a decline—say, for Charcoals 1/ per box, and Cokes 6d. to 9d per box. The works are now only going three to four days a week on the average, so if any demand takes place there is every probability of a quick advance. The following prices will show the range of values: Bradley, 30/; Gwendreath, 27/ 6d. to 28/; R. G., 27/ to 27/ 6d.; Cwmfelin, 27/ 6d.; Ynis, 27/ 3d.; Iwen, 27/; Siluria, 26/ 6d.; Coke: Pen, 24/ 6d.; Dunvant, 22/ 3d.; Gelly, 22/ 2d.; Ypsitty, 22/ 3d.; Oldcastle, 22/ 6d. to 22/ 9d.; Diamond Y., 21/ 6d.; Charcoal Ternes: Dean, O.F.P.P., and S.T.P.L., 24/; Coke Ternes: L.F. and C.F, 21/ 3d.; Neath, 21/ 6d. The total exports of terne and tin plates from Liverpool during July to New York, Philadelphia, Baltimore and Boston were 120,372 boxes as compared with 55,627 boxes during July 1874.

ERNEST W. G. MURRANT Esq., of London, under date of August 6, says: "The stocks in London on 1st inst. show a decrease of about 600 tons as against those of the 1st ult., and this circumstance has induced holders to ask higher rates. The available stocks in London and Holland show an increase of about 70 tons over those of 1st July, so that the statistical position can scarcely be said to have been materially altered. The Board of Trade figures for the first six months of the last three years are as follows:

IMPORTS.

1873.	1874.	1875.
Tons	Tons	Tons
4,725	4,038	9,871

Average, 6,211 tons.

EXPORTS.

1873.	1874.	1875.
Tons	Tons	Tons
2,930	5,479	4 646

Average, 4,352 tons.

From these figures it will be seen that there is a total of about 6700 tons of metal available for 1875 over that for last year. Under these circumstances the probability of a future rise or fall in values may be safely left to the judgment of those interested. The month's sales have been in Straits 1000 tons, and Australian 600 tons at 74/ to 82/ for cash and prompt. A drop of about £6 having occurred in July.

Lead.—The sales during the week have not aggregated more than 175 tons at 5 90c.@5 95c. gold, for Domestic. Foreign is very quiet, and in light stock, and is held at 6¾c.@6¾c. We note the shipment to this port by ship *Annie M. Small*, from San Francisco, August 9, of 6,337 pigs of Selby's refined.

Spelter and Zinc.—Domestic Spelter is quiet, and being sold at 7¼c.@7½c. currency. Foreign is also quiet, at 7¾c.@7¼c. gold. There is but little doing in sheet zinc which is quoted at 8¾c.@9c. gold.

Antimony is quiet at 13c. gold.

Quicksilver.—This market is quoted at 75c., while our latest mail advices report sales in San Francisco at 67½c.@70c. gold per lb. London mail advices quote at £10 per flask of 75 lb.

The San Francisco *Commercial Herald* of August 5th says: "The export demand for China is continued upon a liberal scale, and to the full extent of the supply: the uniform price paid for parcels, 70c.

"The receipts for the month of July aggregate 4,657 flasks, of which 428 flasks were received from coast ports and 4,229 flasks from bay points. The exports per *Great Republic*, hence August 2d, were 1,021 flasks, valued at $55,526."

Our monthly receipts of this article compare with 1874 as follows:

Months.	1874 Bay, flasks.	1874 Coast, flasks.	1875 Bay, flasks.	1875 Coast, flasks.
January	972	25	1,605	2
February	1,709	..	3,284	309
March	1,830	..	3,779	465
April	1,862	..	3,718	100
May	1,964	20	3,298	303
June	1,845	..	3,776	320
July	1,923	..	4,229	428
Totals	12,105	45	23,689	1,927
Increase in 1875	11,584	1,182		

FINANCIAL.

New York Stocks.

FRIDAY, August 20, 1875.

We note an advance of 1½ per cent. in the Delaware Lackawanna and Western RR. shares, and also a slight advance in N. J. C. RR. With these exceptions the market is lower, closing at the quotations given below; sales for the week show a slight increase.

Mariposa L. and M. Co. stock, exhibits a slight decline as compared with our last quotations, with sales of some 500 shares for the week. The directors of the Company have decided to levy another assessment of $1 per share, or 1 per cent., aggregating $100,000, during the present fiscal year, to build a new dam and canal, surveys for which are completed, and to put the Ophir Mills in condition to crush ores. The construction of this dam will give the Company a water power sufficient to crush 1000 tons of ore per day.

The tunnel was in 1030 feet, Aug. 10th, in very hard rock and an increased amount of water running.

The Gutta Percha and Rubber Manufacturing Company of this city has declared a dividend of five per cent. on its capital stock, payable on and after Sept. 1st next.

A detailed statement of the affairs of DUNCAN SHERMAN & Co. shows the deficiency of their assets as compared with liabilities to be $2,790,000, the total indebtedness amounting to nearly $5,000,000. They have made a proposition to their creditors to pay 33⅓ cents on the dollar, the payments to be made in five installments, with interest extending to Nov., 1877. The proposition further reads that should the assets realize more than 33⅓ per cent., all such surplus will go to the benefit of the creditors.

Transactions in Bonds are very limited with quotations generally lower.

QUOTATIONS AND SALES OF STOCKS:

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	*275	—
Consolidation Coal Co	47½	46	46	550
Spring Mt. Coal Co	—	—	62	—
American Coal Co	50	42½	42½	50
Maryland Coal Co	—	—	*19	—
Cumberland Coal and Iron Co	—	—	110	—
Del., Lack., and West. RR. Co	121¾	120½	121½	1767
Morris and Essex RR	—	—	102½	—
New Jersey Central RR. Co	110½	110	110½	130
Delaware and Hudson Canal Co	120⅛	119⅞	120	489
Quicksilver Mining Co. pref'd	—	—	21	—
" " " Common	—	—	16¼	100
Mariposa Land & Min. Co. various	11	10⅜	11	500
St. Louis & Iron Mountain RR	—	—	18	—
Lehigh & Wilkes-Barre Coal Co	—	—	—	—
Total Shares sold				3586
Sales for the week previous				3004
Increase				582

* Asked.

Sales of Bonds.

For the week ending Aug. 20th, 1875.

	Sales.	Price	
Ches. & O. R. R. 6s, Ex. cou	3,000	33 @	34
" " " coupon on	—	— @	38
Central RR. of N. J. 1st Mtg. N.	1,000	— @	110
" " " 1st Cons.	—	— @	106¼
" " " Cons. Convt.	—	— @	109
Am. Dock Imp. Bonds	—	— @	99¾
Del. and H. C., 1st Mtg. Reg. 1894,	—	— @	106⅛
Del. and Hudson Canal, 7s, 1891,	—	— @	107½
Del., Lack. & W. R. R., 7s, conv.	—	— @	119
" " " " 2d Mtg.	—	— @	111
Morris and Essex, 1st C. gold	10,000	— @	104¼
" " const. "	1,000	— @	100
" " 2d m	—	— @	105⅛
St. Louis & Iron Mount'n 1st Mtg.	—	— @	90
St. Louis & Iron M'tn, 2d Mtg.	—	— @	49
Total Sales	$ 14,000		

Quotations in the last column, in the absence of sales, represent the latest prices bid.

Philadelphia Stocks.

PHILADELPHIA, Aug. 20, 1875.

The Philadelphia Stock Market continues very dull; the amount of sales for the week showing a decrease of some 12,500 shares from those reported in our last. The Lehigh Valley and Reading R R. stock exhibit a slight advance, but generally the list is irregular, with but slight alterations in quotations.

The dealings in bonds for the week show an increase in sales at generally lower prices, transactions have been principally confined to the Schuylkill Navigation Co.

The Delaware Division Canal Company announces a semi-annual dividend of 4 per cent. payable on demand.

The Lehigh Valley Railroad Company gives notice that all certificates for new stock are now ready for delivery on presentation of full paid receipts.

The Pennsylvania Railroad Company gives notice that it will take up any of its Bills Payable maturing in August or September, 1875, at a discount of 5 per cent. per annum. This announcement of the Company implies that it has a pretty large surplus of ready cash in the Treasury. Forty shares of the Westmoreland Coal Co. stock, sold at auction, on the 17th inst., at $87 75 per share, also $6,000 ($500 each) Hackettstown Mining and Manufacturing Co., N. J., 7 per cent. coupon bonds at $42 50 each

QUOTATIONS AND SALES OF STOCKS

	Highest	Lowest	Closing	Shr's
Huntingdon and B. T. RR.	—	—	7	—
" " " Pref'd.	—	—	13	—
Lehigh Valley RR. Co.	62⅞	62¼	62¼	255
Little Schuylkill RR	—	—	50⅛	53
Northern Central RR.	—	—	29¼	—
North Pennsylvania RR.	—	—	52½	50
Pennsylvania RR.	50⅜	50¼	50¼	17440
Reading RR.	55½	55¼	55½	1441
Delaware Division Canal	—	—	—	—
Lehigh Coal and Nav. Canal.	51⅛	51	51⅛	2866
Morris Canal	—	—	*50	—
" Preferred	—	—	129	—
Pennsylvania Canal.	—	—	—	—
Schuylkill Navigation Canal.	—	—	7½	—
" " Preferred.	—	—	15	630
Buck Mountain Coal Co.	—	—	—	—
Fulton Coal Co.	—	—	—	—
Locust Mountain Coal Co.	—	—	—	—
Westmoreland Coal Co.		—	87¾	—
Cambria Iron Co	—	—	—	—
Crane Iron Co.	—	—	—	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co.	—	—	72½	—

Total shares sold..... 22,675
Sales for the week previous..... 35,154
Decrease..... 12,479

* Asked.

Closing quotations, in the absence of sales, represent the latest prices bid.

Sales of Bonds.

For the week ending Aug. 20th, 1875.

	Sales.	Price
H and B. T. RR. 1st mortgage, 78.	—	— @105
" " " 2d " "	—	— @102
" " " 3d " cons.	—	— @ 55
Lehigh Valley RR. 6s, '98.	—	— @103¼
" " " 7s, 1910	1,000	— @111⅞
" " " con. mtge. 6s reg.	7,000	99¼@100
North Penna. RR. 2d mtge. 7s,	—	— @103
" " " 1st mtge. 6s, '85.	2,000	— @102
Pennsylvania RR. 1st mtge. 6s, '85.	22,000	103⅛@104⅛
" gen. " reg. 1910	9,000	103¾@103¾
" " gen. " 6s	2,000	— @100⅜
Phil. & Reading RR. 6s, 43 or 44 '80.	1,000	— @102½
" " deb. bonds.	1,000	— @ 80½
" " " G. M. 7s, con. 1911,	40,000	— @106⅜
" " " reg. 1911,	—	— @106¾
" " " 6s g 1911	—	— @106¾
" " new convertible 7s '93.	100	— @106½
Phil. & Reading C. & I. Co. 7s deb. '92.	—	— @ 83
" " " " 7s '92-3.	—	— @—
Lehigh Coal & Nav. Canal, 6s '84.	—	— @100¾
" " " RR. '97	—	— @100
" " " '77	—	— @*97
" " " conv. '82	—	— @102
" " " g. '94	—	— @105½
" " " gold, '97	5,000	101¾@102
Morris Canal, 1st mtge. 6s, '76.	6,000	— @102
" " 2d " '76.	—	— @100
" " boat, '85.	—	— @100
Penn. and N. Y. Canal, 7s.	2,000	— @103¾
Schuyl. Nav. Canal, mtge. 6s, '95.	26,000	79 @ 79⅛
" " " 2d " 1907.	—	— @ 81½
" " " 1st mtge. 6s c.	—	— @ 79
" " " 6s '82.	1,550	79 @ 79⅛
" " " 6s boat and car, 1913.	—	— @ 78
" " " 6s " " 1872,	—	— @ 98¼
" " " div. scrip.	—	— @ 95¼
Susquehanna Canal. 6s '94.	—	— @ 77½
" " Pfd. 6s.	—	— @ 85
Del. Division Canal 6s	—	— @ 97
Chesapeake & Delaware Canal.	—	— @ 85
Susquehanna Coal Co. 7s.	—	— @ 70

Total amount of sales..... $89,650
* Asked.

(BY CABLE.)

London.

FRIDAY, August 20, 1875;

The London Stock Market closed quiet and firm for the following securities at the quotations annexed. The shares of the Reading Railroad Company have advanced ¼ per cent. since yesterday. Pennsylvania Railroad remains steady. U. S. 5-20s have advanced one per cent. compared with our last.

Philadelphia and Reading R. R.	50¼
Pennsylvania R. R.	45½
United States 5-20s new	105⅛
Consols for money	94¾

Gold and Silver Stocks

SAN FRANCISCO, Aug. 18th, 1875.

The quotations of the San Francisco Stock Market continue very irregular. Eureka Consolidated shows a decline of $12 per share from our last quotations. This decline is undoubtedly due to the falling off in the company's dividends to $1 per share, payable on August 5. The June dividend was $2 per share.

Imperial exhibits a slight advance; the face of the north drift on the 1900-foot level is in ore which assays from $60@$80 per ton. This company has levied an assessment of $1 per share, delinquent August 20.

Savage is down $3 per share. An assessment of $5 per share has been levied on the stockholders, delinquent August 16. Judge BRYAN has begun a suit against the company to obtain possession of 19¼ feet of ground on the Savage mine, valued at $300,000. It is reported that the mine is controlled by the Consolidated Virginia clique, and has recently had machinery erected over the main shaft to extend its workings to a depth of 4,000 feet.

Consolidated Virginia exhibits a slight decline compared with our last, closing at quotations given below. The total product of this company for the month of July amounted to $1,603,275 44. In one day $300,000 in bullion was received by this company from the mine.

The Director of the Mint has made arrangements for $9,000,000 silver bullion from the Comstock mines, for coinage into subsidiary coins.

It is estimated that the total coinage at the Philadelphia Mint, and at the San Francisco and Carson City branches for the present fiscal year will be as follows:

Gold coin	$34,000,000
Trade dollars	6,000,000
Subsidiary silver coin	5,000 000
Minor coinage	250,000
Total	$45,250,000

The annual report of the Yellow Jacket silver mine is as follows:

RECEIPTS.

Cash on hand	$ 40.858 44	
From assessments	360,000 00	
From all other sources	7,348 30	
		$408,206 74

DISBURSEMENTS.

Labor, machinery, mining supplies, repairs, office and miscellaneous expenses	$339,553 75	
Balance on hand, cash	68,652 99	
		$408,206 74

The following new mining companies have been organized in San Francisco:

Name.	Location.	Capital.
Advance Silver Mining Co.	Nevada,	$10,000,000
Givian Consolidated Gold and Silver Mining Co.	"	10,000,000
Delevan Gold and Silver Mining Co.	"	10,000,000
Great Western Consolidated Mining Co.	California,	10,000,000
Shaver Mining Co.	Nevada,	10,000,000
Southern Star Gold and Silver Mining Co.	"	6,000,000
Exchequer Mining Co. (increased)	"	10,000,000
Hillside Gold and Silver Mining Co.	California,	6,000 000
Vulcan Mining Co.	Nevada,	10,000,000
North Savage Gold and Silver Mining Co.	"	10,000,000
Buffalo Mining Co.	California,	10,000,000
Canyon Consolidated Mining Co.	"	10,000,060
Sentinel Gold and Silver Mining Co.	"	10,000,000
Crusader Mining Co., of Mariposa.	"	5,000,000
Total capital stock		$127,000 000

The Gila Mining Co. have announced their second monthly dividend of 25c. per share, payable August 17. The bullion yield of this company for the month of July amounted to $75,000.

The South Mountain Mining Co. have levied an assessment of $2 per share, delinquent September 14.

The Justice Mining Co. have increased their capital stock from 21,000 to 105,000 shares.

The Northern Belle Mining Company paid a dividend of $50,000—one per cent.—on the 16th inst. out of the earnings for July; the bullion yield for the month amounting to $109,000. The Manhattan silver mine, formerly owned in this city, shipped $29,600 in bullion during the first three days of August. The product of the Raymond and Ely mine for July was $85,984.

The Ophir mine has been shut down, to allow the placing of new hoisting machinery and the re-timbering of 300 feet of the main shaft.

Challar shows an advance. This is said to be due to the rumor that it is the intention to divide the ground into two mines of 100,000 shares each and also to the reported improvement in one of the south drifts. The company extracts about 600 tons of ore per week, the present average assay value of which is equal to $21 50 per ton.

The Sutro tunnel was in nearly 10,500 feet, August 1st, the heading being in ground favorable to rapid work, with water running; temperature, 80 degrees. Between four and five thousand tons of rock are removed monthly.

The following companies have disbursed dividends as annexed during the month of July:

California Powder Co.	1 per cent.	10,000
Giant Powder Co	1½ "	9,000
Oneida Mining Co.	50c per share.	15,000
Redington Quicksilver Mining Co.	$30 "	47,800

During the six months ending June 30 the sales of stocks at the San Francisco Stock Board represented a value of $124,985,200.

Quotations Aug. 18, 1875.

Sierra Nevada.	19	Imperial.	13
Union Consolidated.	11	Yellow Jacket.	96
Mexican.	27	Kentuck.	17
Ophir.	71	Crown Point.	36
California	67	Belcher.	29
Virginia.	326	Overman.	75
Best & Belcher.	59	Caledonia.	31
Gould & Curry.	25	Raymond & Ely.	45
Savage	138	Meadow Valley.	6
Hale and Norcross.	60	Eureka Consolidated.	37
Chollar Potosi.	*117	Eureka G. V.	7
Alpha.	27	Silver Hill	—

* This was the quotation on the 17th inst.

Copper Stocks.

BOSTON, Thursday Evening, Aug. 19, 1875.

Specially reported by WILSON W. FAY & Co., Bankers and Brokers, Room 7, Traveller Building, 31 State street, Boston, Mass.

The Stock Market still remains quiet, and without feature of special interest. Allouez has still made another gain, standing at 17¼ bid, against 15½ a week ago. Calumet and Hecla is strong at 156¼ a gain of $1¼. Quincy is a shade weaker at 40 bid, and 40½ asked. The July product being 273,650 pounds against 300,695 pounds for the corresponding month last year. The annual meeting of the Calumetand Hecla Mining Co., was held yesterday and the following board of directors elected, 61,929 shares being represented. ALEX. AGASSIZ, H. H HUNNEWELL, GEO. HIGGINSON, HENRY S. RUSSELL of Boston and JAS. N. WRIGHT of Michigan. The Co. shows a net surplus after paying their August dividend of $1,822,117 13

The annual meeting of the stockholders of the Copper Falls Mining Company will be held at the office of the company, No. 4 Exchange Place, Room 1, Boston, on Wednesday, September 8, 1875, at 12 o'clock noon, for the choice of directors for the ensuing year, and the transaction of any other business that may legally come before the same

The Franklin stamp mill, which has been idle for several years, is being put in running order. The main water adit has been overhauled and extended out into the lake, reaching deep water. and the track on the incline is being relaid and ballasted.

"Silver Islet," Lake Superior, the sale of which to its present American proprietors the Montreal Mining Company have never ceased to regret, continues to yield richly of its precious metal. 131 barrels 1st choice silver ore were brought to the Wyandotte smelting works for the week ending August 7th.

Quotations August 19, 1875.

	Closing Bid.	Closing Ask'd.
Allouez	$ 17¼	$ 17½
Calumet & Hecla	156½	156¾
Central	33	34
Copper Falls	9	9 50
Dana	— 23	— 27
Duncan Silver	— 23	— 25
Franklin	13¼	13¾
Madison	— 22	— 27
Mesnard	— 65	— 70
Minnesota	2	2¼
National	3	3¾
Petherick	— 80	— 90
Pewabic	5½	5¾
Quincy	40	40½
Ridge	6½	7
Rockland	— 65	— 70
Superior	— 18	— 20
Am. Cable Screw Wire	4¼	4¾

Gas Stocks.

NEW YORK, August 20, 1875.

We note a sale of 20 shares of the New York Gas Light Company's stock at auction on the 18th inst. at $154 per share.

250 shares of the San Francisco Gas Light Company recently sold within the limits of our quotations. This Company has declared a monthly dividend of ¾ per cent.

We are indebted to the courtesy of Messrs. W. B. SCOTT & Co., Bankers and Dealers in Gas Stocks, No. 24 Pine street, New York, for much of the valuable information contained in the following table:

	Capital Stock.	Par-value.	Offered.	Asked.
Mutual Gas Light Co., N.Y. City	$5,000,000	$100	103½	105
New York " " " "	4,000,000	100	155	
Metropolitan " " "	2,500,000	100	159	165
Manhattan " " "	4,000,000	50	295	298
Harlem " " "	1,850,000	50	131½	135
Westchester Co. " New York.	466, 00	100	100	
Brooklyn " " Brooklyn.	2,000,000	25	245	250
Citizen's " " "	1,200,0 0	20	150	
People's " " " "	1,000,000	10	96	100
Nassau " " "	1,000,000	25	121½	
Metropolitan " " "	1,000,000	100	102	
Williamsburgh " "	1,000,000	50	142	
Jersey City and Hoboken Gas Light Company, New Jersey.	386,000		160	
People's " " of J. C.			65	
Hempstead " " L. I., N.Y.	40,000	100		100
Jamaica, " " " "	25,000	100		100
Rochester " " "		100	50	
People's " " Albany,"	1,000,000	100	45	
Mutual " " Buffalo "	750,000	100	50	
Baltimore. Gas Light Company, Baltimore, Md.	2,000,000	100	190	
People's Gas Light Company, Baltimore, Md.			26½	26¾
Hannibal Gas Light Company, Hannibal, Mo.	100,000	100	90	
Lewiston Gas Light Company, Lewiston, Me	400,000	100		80
Chicago Gas Light Company, Chicago, Ill.	2,000,000	100	145	
Derby Gas Light Company, Derby, Conn.		100	80	
Woonsocket Gas Light Comp'y, Woonsocket, R.I.	150,000	100	100	
Fort Wayne Gas Light Company Fort Wayne, Ind		100	105	
Northern Liberties Gas Light Company, Philadelphia.		25	29½	
Portland Gas Light Company, Portland, Me.	350,000	50	72	75
Hartford Gas Light Company, Hartford, Conn.	700,000	25	41	43
Boston Gas Light Company, Boston, Mass	2,500,000		775	800
Chelsea Gas Light Company, Chelsea, Mass.	300,000		130	
Cambridge Gas Light Company, Cambridge, Mass	700,000		132¾	
Louisville Gas Light Company, Louisville, Ky.			127	
Cincinnati Gas Light Company, Cincinnati, O.			208	
San Francisco Gas Light Co'p'y, San Francisco, Cal			97	97¼
Montreal City Gas Light Company, Montreal, Canada.	1,440,000	40	127½	128½
Toronto Consumers Gas Light Company, Toronto, Ont.	600,000	50	131	
Halifax Gas Light Company, Halifax, N.S.		40	148	

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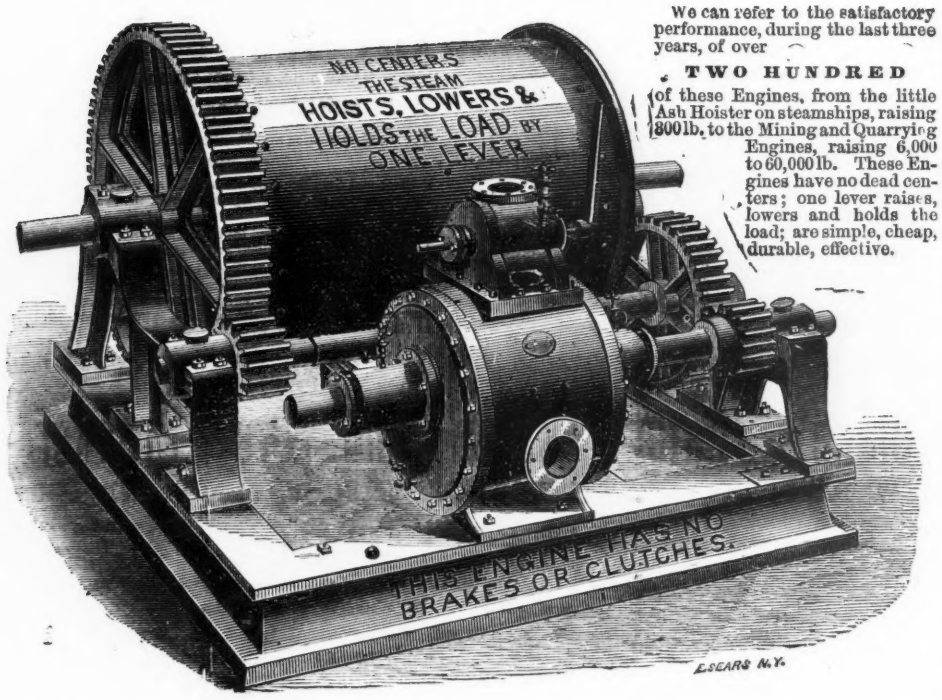

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Announcements to Members and Associates.

I. THE ENGINEERING AND MINING JOURNAL, containing the official reports of proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. Blank proposals for membership can be had on application to the Secretary.

IV. The second volume of Transactions has been mailed to all home members and associates not in arrears. Any member who failed to receive his copy will please notify the Secretary promptly. The Institute is not responsible for the loss of the volume in those cases where members have changed their residences and have omitted to inform the Secretary. Volumes I. and II. will be sent, post-paid, to non-members, at five dollars each.

THOMAS M. DROWN, Secretary, Lafayette College, Easton, Pa.

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The following Properties, situated at Spanish Bar, Clear Creek County, Colorado Territory, and now owned by the United States General Smelting and Mining Co. (Limited), will be offered for Sale, by Public Auction, on the 28th day of August, between 10 A. M. and 4 P. M., unless previously disposed of by private contract:

1. Brick built Mill—main building 140 feet by 80 feet; two wings, each 75 ft. by 50 ft., containing Reverberatory Furnace, capacity 10 to 12 tons Ore per diem, and double hearthed Calciner; 2 Dodge Crushers, Ball Pulverizer, Sample Grinding Machine; 2 Force Pumps; Circular Saw, and all necessary Implements for Smelting; Laboratory and Assay Tools; House and Office Furniture. Machinery run by water power.
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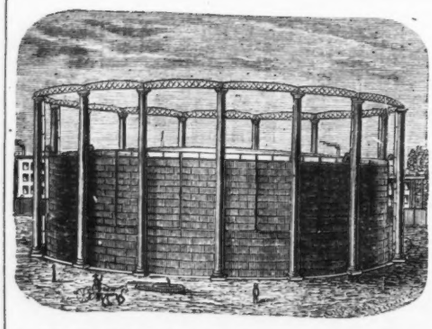

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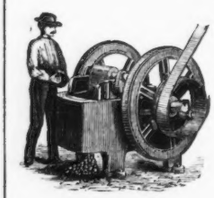

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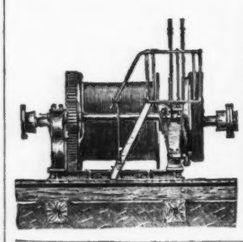

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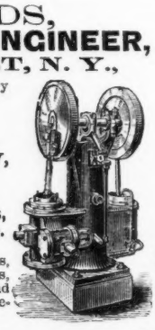

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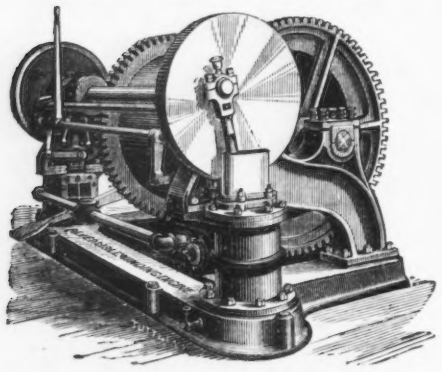

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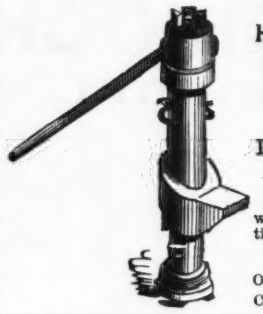

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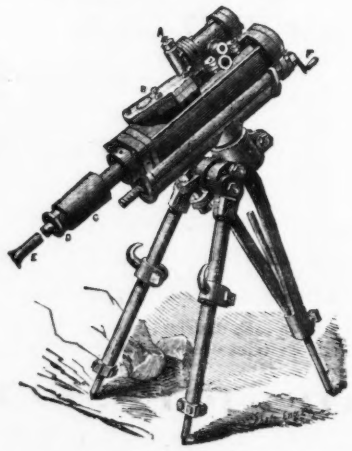

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